

**COMMONWEALTH OF PUERTO RICO
PUBLIC SERVICE REGULATORY BOARD
PUERTO RICO ENERGY BUREAU**

NEPR

Received:

May 27, 2022

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IN RE: PUERTO RICO ELECTRIC
POWER AUTHORITY'S EMERGENCY
RESPONSE PLAN

CASE NO.: NEPR-MI-2019-0006

SUBJECT: Submittal of Annual Report pursuant to
Section 6(m) of Act 83 of May 12, 1941, as Amended

**MOTION SUBMITTING LUMA'S ANNUAL REPORT
UNDER SECTION 6(M) OF ACT 83 OF MAY 12, 1941, AS AMENDED**

TO THE HONORABLE PUERTO RICO ENERGY BUREAU:

COMES NOW LUMA Energy ServCo, LLC¹ ("LUMA"), and, through the undersigned legal counsel, respectfully state and submit:

On May 31, 2021, LUMA submitted to this honorable Puerto Rico Energy Bureau of the Public Service Regulatory Board ("Energy Bureau") an Emergency Response Plan outlining the procedures and actions necessary for responding to any emergency affecting or reasonably likely to affect the Puerto Rico transmission and distribution system ("T&D System"), including fire, weather, environmental, health, safety and other potential emergency conditions (the "T&D ERP"). The T&D ERP was prepared and submitted to the Energy Bureau pursuant to Section 4.2(g) of the Puerto Rico Transmission and Distribution System Operation and Maintenance Agreement dated June 22, 2020 (the "T&D OMA") and in compliance with this Energy Bureau's Resolution and Order of December 31, 2020.

¹ Register No. 439373.

Now, pursuant to Section 6 (m) of Act 83 of May 2, 1941, as amended (“Act 83”)², LUMA herein submits to this honorable Energy Bureau, in *Exhibits 1 and 2*, LUMA’s 2022 annual report on emergency preparedness for the T&D System (the “2022 Annual T&D Emergency Preparedness Report”).

In accordance with Section 6 (m) of Act 83, LUMA’s 2022 Annual T&D Emergency Preparedness Report describes the measures taken by LUMA since it commenced providing T&D System operation and maintenance services pursuant to the T&D OMA³ on June 1, 2021, to address emergencies that could affect the T&D System that may arise during the hurricane season and other atmospheric disturbances, including floods. The 2022 Annual T&D Emergency

² Section 6 (m) of Act 83 requires the Puerto Rico Electric Power Authority (“PREPA”) to submit, no later than May 31 of every year, to the Governor, both Houses of the Legislative Assembly and the Energy Bureau a report:

- [...] stating the measures taken during the preceding calendar year to address the emergencies that may arise with respect to the upcoming hurricane season and other atmospheric disturbances, including floods that may affect the electrical system of the Island. Likewise, said report shall present the adopted plans or protocols to be followed in case of fires in facilities and establishments of [PREPA]. It shall also include any preventive measure identified for the conservation of the power lines in the event of an earthquake. The report shall include, but not be limited to, the following information:
- i. Improvements to the [PREPA’s] Revised Operating Plan for Emergencies due to Atmospheric Disturbances;
 - ii. development of an emergency plan to face a possible earthquake;
 - iii. Adopted plans or protocols to be followed in case of fire in [PREPA’s] facilities and establishments;
 - iv. Status of the tree trimming program in order to protect power transmission lines, while protecting our trees and preventing them from being damaged;
 - v. Decision-making protocol to enforce the shutting down of the electrical system;
 - vi. Trainings offered to [PREPA’s] essential personnel to qualify it on the procedure to be followed in case of emergencies arising from atmospheric disturbances, fire in [PREPA’s] facilities or establishments, or earthquakes, as well as a certification attesting that all the personnel performing supervisory functions in the operating areas has been duly advised on the norms of the operating emergency plan in effect; and
 - vii. Contingency plans to address the situation after a storm, a hurricane, a fire in [PREPA’s] facilities or establishments, or an earthquake, directed to normalizing or reestablishing the electrical system as soon as possible.

Act 83, Section 6(m), 22 LPRA §196(m).

³ Referred to and defined as the O&M Services under the T&D OMA.

Preparedness Report also includes the improvements made to LUMA's T&D ERP to address emergencies due to atmospheric disturbances; a description of the emergency plan to face possible earthquakes; the plans and protocols to address fires in the T&D System facilities; the status of the T&D System tree trimming program to protect the power transmission lines and trees; the decision-making protocol to enforce shutting down the T&D System; the training offered to essential LUMA personnel to ensure they are qualified to follow the procedures to address the aforementioned emergencies; and the contingency plans to normalize or re-establish T&D System operations after a storm, hurricane, fire or earthquake.

LUMA is submitting herein a redacted public version of *Exhibit 2* protecting confidential information associated with Critical Energy Infrastructure Information included in the T&D ERP and an unredacted confidential version thereof. LUMA respectfully requests the Energy Bureau to maintain the unredacted version under seal of confidentiality pursuant to the Energy Bureau's Policy on Management of Confidential Information, CEPR-MI-2016-0009, issued on August 31, 2016, and partially amended on September 16, 2016. Within the next ten days, LUMA will submit a memorandum of law in support of this request for confidential treatment of *Exhibit 2*.

As per Section 6 (m) of Act 83, LUMA is also submitting on May 27, 2022 a copy of LUMA's 2022 Annual T&D Emergency Preparedness Report, including *Exhibits 1 and 2*, to the Governor and both Houses of the Legislative Assembly.

WHEREFORE, LUMA respectfully requests that the Energy Bureau **consider and accept** LUMA's 2022 Annual T&D Emergency Preparedness Report included as *Exhibits 1 and 2* herein and submitted pursuant to Section 6(m) of Act 83 of May 12, 1941, as amended and **maintain** under seal of confidentiality the unredacted version of *Exhibit 2* herein.

RESPECTFULLY SUBMITTED.

In San Juan, Puerto Rico, this 27th day of May 2022.

I hereby certify that I filed this Motion using the electronic filing system of this Energy Bureau. I will send an electronic copy of this **Motion to the attorneys for PREPA**, Joannely Marrero-Cruz, jmarrero@diazvaz.law, and Katuska Bolaños-Lugo, kbolanos@diazvaz.law.



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Exhibit 1

Summary of Emergency Preparedness forming part of LUMA's 2022 Annual T&D Emergency
Preparedness Report



Exhibit 1

Summary of Emergency Preparedness

May 27, 2022

Summary of Emergency Preparedness

1.0 Introduction

LUMA Energy ServCo, LLC (LUMA), as an agent of the Puerto Rico Electric Power Authority (PREPA) in connection with the operations and maintenance of the Puerto Rico Transmission and Distribution System (T&D System), is charged with preparing the annual report on emergency preparedness in connection with the T&D System required under Section 6(m) of Act 83 of May 12, 1941, as amended (Act 83). Act 83 requires that this report be submitted to the Governor, the Puerto Rico Energy Bureau (PREB), and both Houses of the Legislative Assembly no later than May 31st of each year.

This document and the attached LUMA All-Hazards Emergency Response Plan dated May 27, 2022 (ERP) constitute LUMA's 2022 Annual T&D Emergency Preparedness Report in compliance with Section 6(m) of Act 83. The ERP describes the procedures and actions and establishes the structure, processes, and protocols for managing and responding to major electric outages, emergencies, and other incidents that may disrupt the T&D System's operations and services, including those resulting from hurricanes, storms, other atmospheric disturbances, floods, earthquakes, and fires to T&D System facilities. The ERP also covers necessary personnel training requirements and contingency plans to address emergency situations to normalize and re-establish the T&D System promptly. The ERP is composed of a Base Plan establishing the basic framework, protocols, processes, and procedures applicable to all types of hazards and Annexes thereto, covering additional response functions for major outage restoration, earthquakes, fires, severe weather, and cybersecurity and terrorism.

The subjects required under Section 6(m) of Act 83 are identified below and discussed in detail in this document and/or the attached ERP, as indicated below.

2.0 Emergency Preparedness and Training

LUMA is responsible for the safe operations of the Puerto Rico Transmission and Distribution Electrical System, which includes responding quickly and efficiently to any emergency or natural disaster. LUMA's Emergency Response Preparedness program is focused on emergency response management. The work completed as part of this program includes implementing the ERP, establishing the Office of Emergency Management and Business Continuity, establishing the LEOC, and developing the plans, processes, and procedures to be enacted in the event of an emergency. All of these undertakings include measures to be put in place before, during, and after a disaster.

Since LUMA's commencement of operations on June 1, 2021, LUMA has undertaken numerous emergency preparedness and readiness activities and trainings across the organization in order to prepare our people, our facilities, and our operations for natural disasters. These activities have included, but are not limited to:

- Responding to several storms and system outages by activating LUMA's Emergency Operations Center (LEOC) and allowing our people to gain firsthand experience working through a real-life emergency.
- Conducting three emergency preparedness exercises in February, March, and May 2022, including one tabletop exercise with internal participants, one mock drill with Puerto Rico and federal agencies, and one mock drill with internal participants.
- Conducted a joint emergency deployment exercise with FirstNet in May 2022.
- Held several training sessions on Federal Emergency Management Agency's National Incident Management System and Incident Command System throughout the year for individuals

Summary of Emergency Preparedness

assigned to a role in the LEOC, including ICS 100, ICS 200, ICS 300, ICS 400, ICS 700, and ICS 800.

- Procured over 300 utility vehicles and safety equipment available to deploy to support daily operations and emergency response.
- Installed necessary emergency equipment in the primary physical LEOC and purchased necessary supplies for emergency operations.
- Engaged with various industry stakeholders regarding our emergency preparedness, including the Pharmaceutical Industry Association, the Industrial Association, and the Telecommunications Bureau.
- Conducted various preparedness activities in our Control Center to ensure our System Operations team was ready for any emergencies, including on-site generator testing and fuel storage checks, procedure testing, installation and purchase of equipment, and purchasing of supplies.
- Prepared warehouses for storm season by strategically storing materials and moving loose items in yards, increasing levels of critical inventory, and ensuring adequate fuel supply.

The attached ERP provides for training, drills, and exercises designed and conducted to develop and improve the knowledge and skills of personnel assigned to emergency response activities and to support the safe and reasonably prompt completion of all required actions during ERP activations; an exercise program following the guidelines from the Homeland Security Exercise Evaluation Program; and operations-based exercises (including drills and functional exercises) to validate and/or evaluate plans, policies, and procedures, among other things. Please refer to the attached ERP for a complete discussion of these and other provisions related to personnel training and preparation.

All of LUMA's personnel performing key functions in the LEOC have been duly advised and trained on the norms of operating in an emergency.

3.0 Improvements to the ERP

The ERP is reviewed annually and revised as necessary. All LUMA leaders and subject matter/technical experts with responsibilities in this ERP are required to review its contents and update the information to keep the ERP relevant. The ERP is a living document, and LUMA makes revisions deemed necessary after lessons learned during ERP activations and based upon After-Action Reports and Improvement Plans, training and exercises, and government agencies' requests, along with best practices and industry standards.

In accordance with this practice, the ERP has undergone several revisions and updates since May 21, 2021, to address input from reviewers and information obtained from training exercises and emergency events experienced during this time period, resulting in an improved ERP.

The more significant improvements include updating the Base Plan and Annex A, B, and C based on experience and relevant learnings throughout the year and adding Annex D, Severe Weather, and Annex E, Cybersecurity and Terrorism.

4.0 Earthquake Response

In addition to the provisions of the Base Plan, the attached ERP includes an Earthquake Response Annex (Annex C) describing key functions to be implemented in response to an earthquake or earthquake-related hazard affecting the T&D System.

Summary of Emergency Preparedness

5.0 Fire Response

In addition to the provisions of the Base Plan, the attached ERP includes a Fire Annex (Annex B) to support an emergency response of the T&D System for this hazard.

6.0 System Operations in an Emergency

The attached ERP establishes the structure, processes, and protocols for LUMA's emergency response and identifies the unit and individual roles directly responsible for those responses and critical support services. This includes specific procedures for emergency response execution and black-start operations, controlling what comes on or off the system, isolating the grid as necessary during system constraints or lack of capacity, and providing system restoration priorities, among other things.

Please refer to the attached ERP for a complete discussion of these and other provisions related to decision-making protocols and processes.

7.0 Vegetation Management

Effective management of vegetation in and near electric utility infrastructure is critical for the safety of electrical workers and the public and the reliable and resilient delivery of electric service. As Puerto Rico has historically experienced, deferral and lack of vegetation maintenance are significant contributors to poor system reliability, especially in extreme weather events such as hurricanes.

LUMA's ongoing vegetation management activities, in accordance with LUMA's Vegetation Management Plan (VMP), include work to abate or mitigate immediate vegetation risk in the most critical locations, along with an ongoing program to clear and re-establish Rights-of-Way (ROWs) to standard widths. This includes immediate response for the highest risk sites, those that pose hazards to public safety or routinely experience tree-caused service interruptions and reclaiming ROW corridors (especially those impacting the T&D systems).

Since LUMA's commencement of operations on June 1, 2021, LUMA's vegetation management activities have included responding to urgent outages, customer requests, and public safety requests as well as removing vegetation in close proximity to a conductor in various locations that routinely experience vegetation related outages. In addition, LUMA has completed an initial vegetation clearing, first herbicide treatment, and second herbicide treatment at all substation sites.

For the first time in Puerto Rico, LUMA has introduced the use of specialized equipment, including Skid Steer Mulchers, Small and Medium-Sized Forest Mulchers, and Mini-Giraffe Saws on ROWs. This use of specialized equipment to complete work has resulted in more effective and efficient vegetation management practices than historically has been seen in Puerto Rico. This application of specialized equipment has alleviated physically demanding work and, as a result, improved safety. LUMA has utilized this specialized equipment to LUMA conduct maintenance vegetation work on distribution lines and transmission lines in various regions across the island. Thus, effectively, LUMA has started its transition from the initial Rapid Response phase of the VMP to the Reclaiming phase of the LUMA VMP. This transition will continue as the percentage of Reclaiming work continues to increase and the Rapid

Summary of Emergency Preparedness

Response work decreases as forecasted. Throughout this transition, LUMA will continue to support outage response, after-hours callouts, and operationally as needed.

8.0 Major Outage Restoration

The attached ERP contains a comprehensive discussion of contingency plans to address major electric outages, emergencies, and other incidents that may disrupt the T&D System's operations and services from any hazards, including those resulting from hurricanes, storms, other atmospheric disturbances, floods, earthquakes, and fires to T&D System facilities. It also includes an operational and comprehensive framework to address the restoration of the T&D System from major outages, including a Major Outage Restoration Annex (Annex A). Please refer to the attached ERP for a complete discussion of these and other provisions related to contingency planning and electric service restoration.

Exhibit 2

T&D ERP forming part of LUMA's 2022 Annual T&D Emergency Preparedness Report

[Unredacted Version – Confidential]



NEPR

Received:

May 27, 2022

8:03 PM

Emergency Response Plan

Base Plan

LUMA ENERGY

CRISIS MANAGEMENT

May 27, 2022

Letter of Promulgation

As the President and CEO of LUMA Energy (LUMA), I hereby authorize the LUMA All-Hazards Emergency Response Plan (ERP). This Plan provides for LUMA's response, immediate recovery, and restoration of operations to emergency events efficiently and effectively to protect lives, public health, safety, and property; to restore essential services; and to enable and support economic recovery. Threats to continuity of service to our customers are constantly evolving. LUMA Energy stands prepared to respond to and recover from any threat or hazard.

The purpose of this All-Hazards ERP is to outline and assign responsibilities for command, control, and coordination of efforts across the organization in response to electrical system hazards. This Plan is designed to be a guide for the activation of the emergency response organization and aligns with municipal, Commonwealth, and federal emergency plans. This Plan also describes how LUMA implements the federally adopted Community Lifelines relative to energy restoration and guides how LUMA applies these concepts to its emergency operations.

LUMA understands that timely and accurate information for our customers and other stakeholders is just as important as a safe and prompt restoration of service. This Plan, to include its Annexes and Appendices, outlines extensive measures and processes for information sharing with our stakeholders. LUMA is prepared to work with Federal, Commonwealth, and municipal government entities, as well as with non-government organizations, and the private sector to affect a swift, transparent, and coordinated response to emergency situations.

Since the hazards and their impacts facing Puerto Rico are constantly evolving, I charge the organization with continuing to modify this Plan over time in response to these emerging threats and to plan, prepare, train, exercise, and continually improve our response capabilities for the benefit of our customers and stakeholders. This Promulgation is effective upon its signing and shall remain in full effect until amended or rescinded.



Wayne Stensby
President & CEO
LUMA Energy

Executive Summary

The LUMA All-Hazards Emergency Response Plan (ERP) reflects organizational doctrine and policy, supersedes all previous deliberate plans, and integrates with all LUMA organizational units. The ERP addresses electric utility emergency response to any disaster and addresses customer outages due to natural causes (e.g., thunderstorms, hurricanes, tornadoes, storm surge, earthquakes, tsunamis, etc.), human causes (e.g., major equipment failure, civil unrest, terrorism, wildfire, cyber-attacks, etc.), and technological causes (e.g., nuclear radiation, dam failures, transportation accidents, etc.), resulting in significant customer service interruptions. The ERP is predicated on knowing and understanding the magnitude of the event. The Major Outage Restoration Annex (Annex A) included in this plan, operationalizes the sequence of energy restoration revolving around key infrastructure that supports the protection of life and property.

Emergency Response Plan Description

The ERP is a foundational document that provides the mission and the concept of operations on how to respond to, recover from, and mitigate against both manmade and natural disasters through actions of planning, training, and exercises that are related to the electric utility services and assets operated by LUMA throughout Puerto Rico. It describes LUMA's approach to incident operations and the coordination structure(s) that implement them. It also contains stabilization and restoration end-states as defined by Community Lifelines. The primary objective of Community Lifelines is to ensure the delivery of critical services that alleviate immediate threats to life and property when communities are impacted by disasters. In addition, the ERP provides an incident management structure for coordinating and deploying the essential resources necessary for LUMA's response (see Figure 1). The Annexes and Appendixes to the ERP provide LUMA-specific operations and guidance on how the response and recovery concept of operations, tasks, and responsibilities are achieved. Checklists and other plan execution tools facilitate the use of these documents. Annex A details how the organization responds during an emergency, the system of prioritization, and the power restoration strategy, among others. Through exercise and training, LUMA staff applies the concept of operations to achieve the incident objectives and successful outcomes of each response.

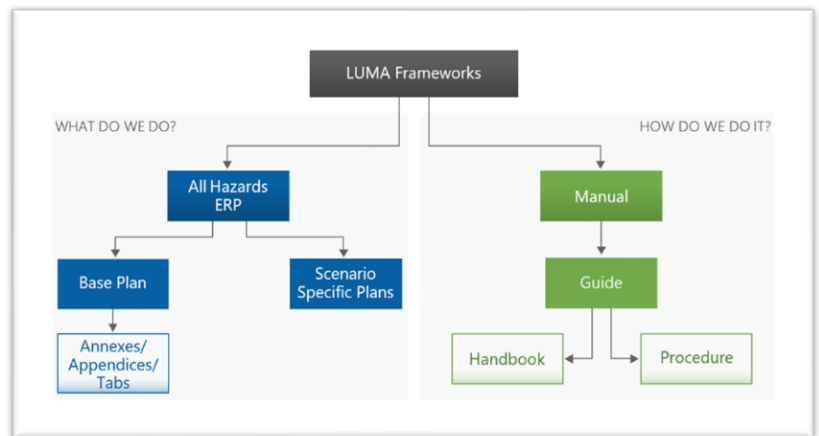


Figure 1: LUMA Frameworks

Senior Leader's Intent

LUMA's ERP establishes a simple but detailed structure for the management of and response to emergency events that affect Puerto Rico's Transmission and Distribution System (T&D System). It provides the structure and mechanism for the coordination of power restoration throughout Puerto Rico.

This Plan adopts guidance from Federal documents such as the National Response Framework (NRF) and Comprehensive Preparedness Guide (CPG) 101. It promotes a common understanding of risk-informed planning and decision making. Furthermore, it assists planners in examining a threat and developing integrated, coordinated, and synchronized plans, while pursuing the assigned functional responsibilities to ensure effective and efficient incident management.

Vision for Emergency Response

LUMA developed and maintains a comprehensive set of plans to prepare for, respond to, and recover from any major outage, and inform customers, stakeholders, and the public regarding all types of business interruption incidents that might occur.

Corporate Preparedness Strategy

LUMA's approach to emergency management reinforces our commitment to our customers and the communities we serve. LUMA utilizes effective emergency management principles and protocols that enhance our ability to provide safe and reliable energy services. LUMA delivers on its commitments to its customers by:

- Conducting risk assessments
- Developing appropriate prevention or risk mitigation strategies
- Implementing comprehensive emergency preparedness programs
- Communicating timely and accurate information to customers and other stakeholders
- Responding with appropriate resources to address the emergency
- Recovering from emergencies expeditiously
- Continuously improving

A Living Document

This ERP is reviewed annually and revised as necessary. All LUMA leaders and subject matter/technical experts with responsibilities in this ERP are required to review its contents and update the information to keep the Plan relevant. As shown in Figure 2, the ERP is a living document and LUMA makes revisions deemed necessary after lessons learned during ERP activations and based upon After-Action Reports (AARs) and Improvement Plans (IPs), training and exercises, and government agencies requests, along with best practices and industry standards.

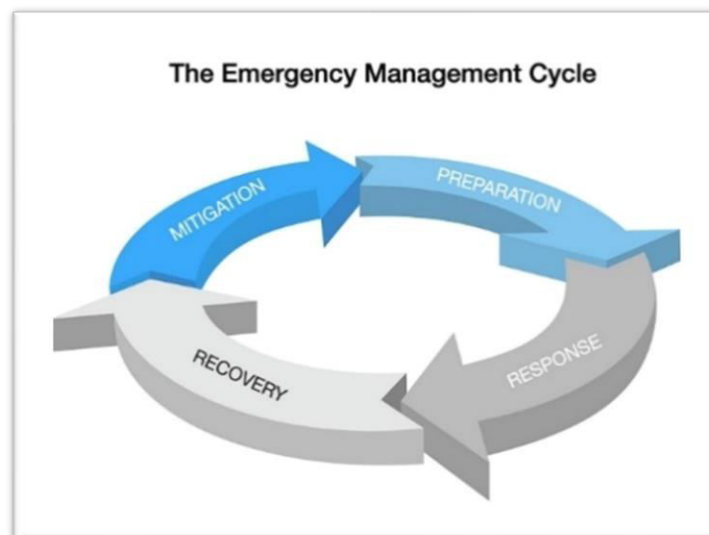


Figure 2: The Emergency Management Continuous Improvement Cycle

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1 Purpose

The purpose of the LUMA Energy All-Hazards Emergency Response Plan (ERP) is to outline operational concepts and organizational arrangements. The ERP is applicable to all LUMA personnel that are assigned functional responsibilities. One of the features of the ERP is scalability. Many emergencies begin as a municipal level emergency and can quickly escalate to a system level emergency. By ensuring the key elements of the Incident Command System (ICS) are implemented at each level within the organization, LUMA can accommodate municipal, regional, and system-level emergencies. These key elements are easily replicated using common roles and responsibilities.

The ERP outlines LUMA's philosophy and procedures for managing major outages, emergencies, and other incidents that may disrupt electric service to our customers, including as a result of hurricanes, storms and other atmospheric disturbances, floods, fires to T&D System facilities and earthquakes.

It further establishes the structure, processes, and protocols for LUMA's emergency response and identifies unit and individual roles directly responsible for those responses and critical support services. In addition, the ERP provides a management structure for coordinating and deploying the essential resources necessary for LUMA's response. Major Outage Metrics may apply during incidents that meet the criteria for a major outage event. The Major Outage Metrics can be found in Appendix A of Annex A.

The ERP has been developed to enable LUMA to provide services and effectively carry out its responsibilities pursuant to the Puerto Rico Transmission and Distribution System Operation and Maintenance Agreement dated as of June 22, 2020 (T&D OMA). As part of providing management, operation, maintenance, repair, restoration, and replacement of the T&D System, LUMA's Scope of Services detailed in Annex I of the T&D OMA includes emergency preparedness planning, response, and implementation of the ERP to maintain business continuity and electric service, disaster recovery and emergency response and restoration, and all necessary emergency response, business continuity, reporting and communication functions relating to the T&D System. LUMA's responsibilities include direct responsibility for media and other communications with public officials, regulators, and local municipalities and counties regarding storm preparation, management, coordination, and response for the T&D System. LUMA will take actions during an emergency event that LUMA deems in good faith to be reasonable and appropriate under the circumstances and in accordance with the ERP.

The ERP also addresses the requirements under Section 6 (m) of Act 83 of May 2, 1941 (Act 83), as amended by Act 17-2019, which provides for the submission to the Governor, the Energy Bureau, and both Houses of the Legislative Assembly, of an annual report on emergency preparedness. In addition, implementation of the ERP furthers Puerto Rico's energy public policy objectives stated in the Puerto Rico Energy Transformation and RELIEF Act, Act 57-2014 and Act 17-2019, including taking actions to further the reliability, resilience, and safety of the electric power service in Puerto Rico.

2 Scope

This ERP applies to any hazard or threat that results in or could result in a major potential impact on the integrity of the T&D System and/or a disruption of electrical service to LUMA customers. Additionally, the ERP applies to LUMA personnel and staff, affiliate company employees, contractors and mutual aid resources, or any other personnel working at the direction or under the authority of LUMA Energy.

For the purpose of the ERP, an Emergency or Emergency Event is defined as a Type 3, 2, or 1 event, as described in the Event Classification Type and LUMA Emergency Operations Center (LEOC) Activation Tables, found in Appendix A. Non-Emergency events, or Type 5 and 4 events, are not necessarily governed by this ERP, but are defined, nonetheless.

LUMA's Emergency Operational Boundaries are split geographically into the West Division, Central Division, and East Division. There are two Regions within each Division and twenty System Emergency Response Team (SERT) Boundaries which are made up of 78 municipalities. These are LUMA's Emergency Operational Boundaries (see Figure 3).

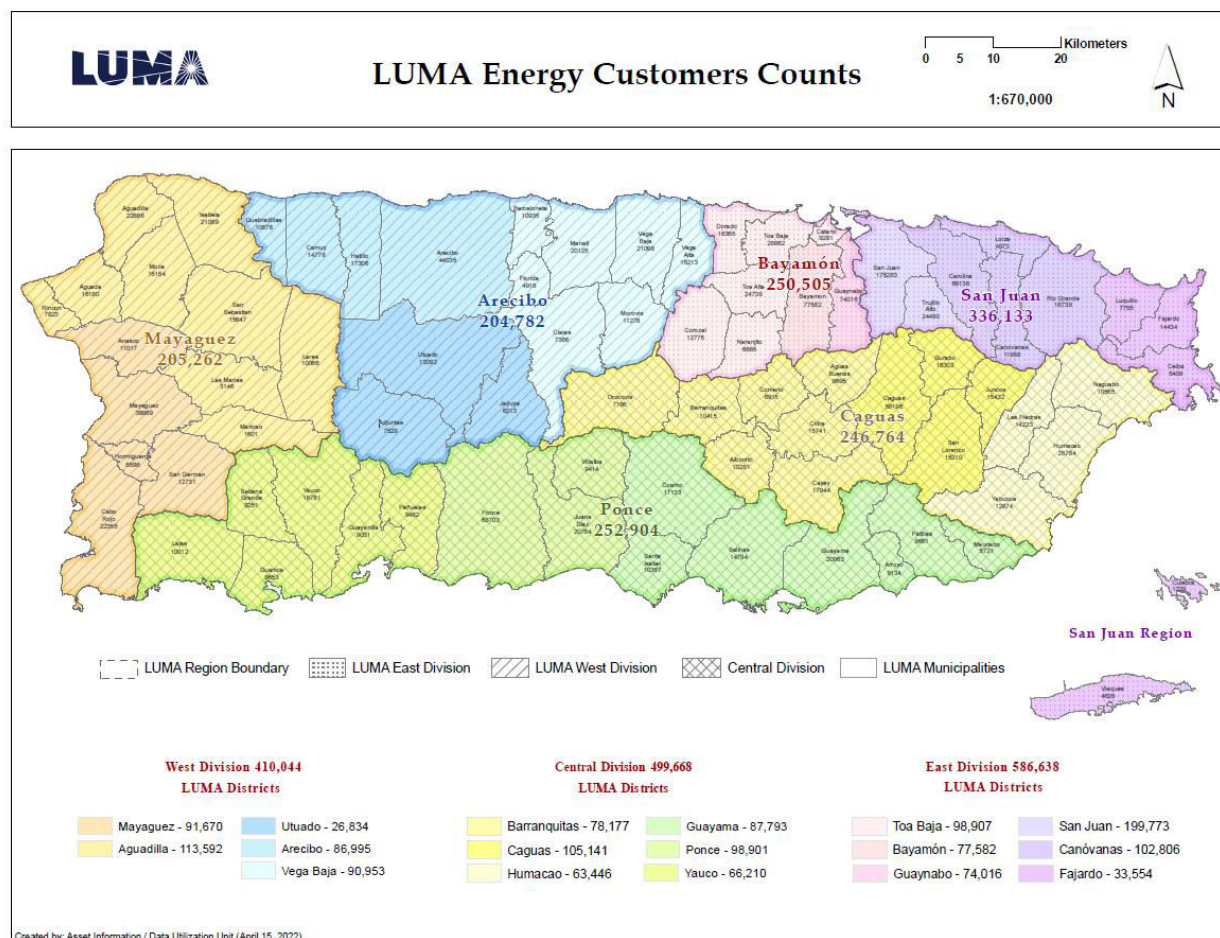


Figure 3: LUMA Emergency Operational Boundaries

3 Implementation

This ERP utilizes the National Incident Management System (NIMS) as the guide for the comprehensive approach to incident management that is applicable across functional disciplines and at all levels of the response structural framework. Adopting NIMS improves the effectiveness of emergency response across a wide spectrum of potential incidents and hazards, regardless of cause, size, or complexity. NIMS provides a common framework to achieve common goals and integrate diverse capabilities.

Overall, this approach allows for consistent coordination at all levels of government (federal, state, local, and tribal), the private sector, and non-governmental organizations in a variety of incident management activities. LUMA has shaped its emergency response structure around ICS for the purpose of providing a consistent all-hazards incident management methodology that allows for integration into a nationally standardized response and recovery structure.

4 Situation and Assumptions

4.1 Situation

Puerto Rico sits between the North Atlantic Ocean and the Caribbean Sea as the smallest and most eastern island of the Greater Antilles. Out of the five geographical regions that make up Puerto Rico, the northern region is the most populated and economically diverse, and is home to the capital, San Juan. The island is about 9,086 km² (3,508 mi²), of which 60% is mountainous terrain. Approximately 3.2 million people call Puerto Rico home.

A variety of events can adversely impact the integrity of Puerto Rico's energy grid. With the increased frequency of hurricanes in the Atlantic Ocean, the chance of a hurricane disrupting the island's electricity service has also increased. Although hurricanes and their accompanying storm surges pose the greatest threat to life and property, tropical depressions and tropical storms can also be devastating. Storm surge and flooding can account for many casualties and personal property damage. Non-weather events, such as earthquakes and fires, can also cause loss of life and extensive damage to infrastructure and critical systems. LUMA has a supporting Earthquake Annex and Fire Annex to support an emergency response of the T&D System for these hazards.

LUMA Energy provides electric services to approximately 1,480,000 customers in 78 municipalities in Puerto Rico (see Figure 4). Since electricity plays a crucial role in our daily lives, quick restoration of electric service is a customer expectation and a LUMA goal, along with the power restoration prioritization of critical infrastructure for the health and safety of Puerto Rico. The response to system disruption is grounded in evaluating the extent of the event, as well as resource availability, to support the response and restoration process as well as:

- Damage Prediction Modeling
- Rapid Damage Assessment
- Field Labor resource Predictions and Placement on the island
- Material Requirement Predictions and actual placement during an event
- Training/Exercises/Drills
- Effective Communication

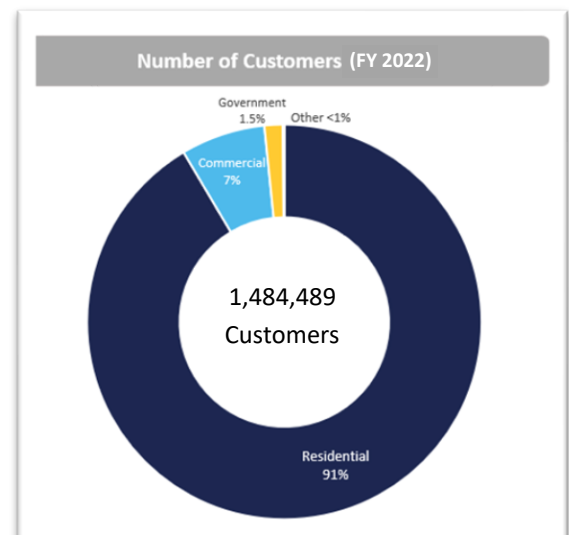


Figure 4: LUMA Customers

The Plan has been designed to provide a systematic organized approach to facilitate a safe and efficient response to a major outage caused by any hazard. The Plan is constructed to provide a trained, operationally ready workforce, and an effective process that can be employed as required to deal with the unique aspects of each major outage. The effectiveness of this Plan is based on LUMA's commitment to prepare and implement procedures outlined within this Plan. The development of an After-Action Report (AAR) following exercises, drills, and real-life emergency events further enable ongoing improvement in LUMA's response and restoration processes.

Execution of the appropriate responses to affect rapid and safe recovery is dependent upon the scalability of the Plan. The number of customers affected, and the magnitude of a major outage event vary, but the operational concept stays consistent. The level of recovery resources can be adjusted as needed in accordance with the Major Outage Metrics in Annex A, Appendix A.

4.2 Assumptions and Considerations

- Puerto Rico is vulnerable to hazards that could, individually or in combination, negatively impact the T&D System infrastructure LUMA operates.
- LUMA customers include government, business, and individual clients throughout the island.
- An emergency event and/or major outage may occur at any time of the day or night, weekend, or holiday, with little or no warning.
- LUMA has the duty, responsibility, and designated function to maintain, disseminate, and implement the ERP.
- Response to all emergency events should be guided by the principles of the NRF, NIMS and ICS.
- The impact of emergency events on the energy infrastructure LUMA operates varies in scope and severity.
- Because of geography, resources may be limited to what is in Puerto Rico at the time of the emergency event, and it may take days or weeks to receive resources from the mainland.
- Mutual Aid partners on and off-island may be limited to the resources they have available at the time of the event. They are also limited in the resources that can quickly arrive from the mainland or other locations in the Caribbean.
- LUMA is a member of utility associations and has mutual aid assistance agreements with other utility providers on the island and the mainland.
- The ERP is tested through drills and practical exercises to evaluate the effectiveness and the need for changes or revisions. LUMA exercises the ERP on an annual basis.
- In the event of an emergency or disaster situation, LUMA response personnel and their families may be impacted, affecting the accessibility of needed human resources.
- LUMA's response may be complicated by COVID-19 outbreaks, travel restrictions, testing, and entry requirements.
- Negative impacts of a major event include, but are not limited to displaced populations, disruptions in daily life activities, essential public services and government infrastructure, and environmental damage.
- Access to disaster areas may be limited because of damaged infrastructure.
- In organizational, geographical, and jurisdictional terms, events are attended to at the lowest possible level.
- The Incident Commander (IC) may declare activation of the ERP either before an emergency event (based upon outage projections) or after an emergency event (based upon outage and restoration estimates).
- ERP Event Classification Types 1, 2, and sometimes 3, require full activation of ICS. During an ERP activation of a Type 1, 2 or 3 Event, all functions should be coordinated through the LEOC.
- The LUMA facility in Santurce is located at 1250 Avenida de la Constitución, San Juan and serves as the primary LEOC.

5 Mission

LUMA strives to meet the needs of customers through risk assessments and continuous communications regarding planning for, responding to, and recovering from major outages to achieve excellence as an industry leader. LUMA consistently emphasizes public and employee safety as a top priority during each response. LUMA's efforts to protect customers and build back stronger – through prevention and mitigation of potential impacts – will drive the overall resilience of maintaining electric utilities throughout Puerto Rico.

5.1 Community Lifelines


The utilization and analysis of Community Lifelines enhance LUMA's ability to positively impact the communities of Puerto Rico during normal operations and a major outage. Community Lifelines not only enable the continuous operation of critical government and business functions, but they are also essential to human health, safety, and economic security.

The seven Community Lifelines were established by the Federal Emergency Management Agency (FEMA) following Hurricane Maria in 2017. They were tested and validated in the aftermath of five disasters in 2018 and 2019, starting with Hurricane Michael. FEMA wrote an After-Action Report (AAR) of each disaster to analyze their management of the disaster. The AAR recommended updating the NRF to prioritize the restoration of seven key lifelines and to emphasize the importance of cross-sectional coordination both ahead of, during, and after a disaster (Kunkel, 2020).

Stabilizing Community Lifelines is a priority. In some cases, the disruption to lifeline services is brief, but it is not uncommon to prioritize the restoration of crucial lifelines in phases. Contingency response solutions (e.g., power generators, emergency communications) are frequently utilized to reach stabilization only but they allow time to accomplish the long-term recovery goal of restoration. Until the Community Lifeline services have been re-established, contingency response solutions should remain in place. The National Preparedness Goal established 32 core capabilities in emergency management to address the greatest risks. Figure 5, on the following page, details each lifeline and the core capabilities that are addressed by each of them.

The ERP discusses all seven Community Lifelines, as all critical infrastructure sectors rely on the functions provided by them (NIPP, 2013). The seven Community Lifelines are:

- Energy (Power & Fuel)
- Food, Water, Shelter
- Transportation
- Communications
- Health and Medical
- Safety and Security
- Hazardous Materials

LIFELINES*	CORE CAPABILITIES**	DESCRIPTION
 Safety and Security	<ul style="list-style-type: none"> On-scene Security, Protection, and Law Enforcement Fire Management and Suppression Mass Search and Rescue Operations Public Health Healthcare Emergency Medical Services Fatality Management Services Environmental Response/Health and Safety Infrastructure Systems 	<p>Law enforcement and government services, as well as the associated assets that maintain communal security, provide search and rescue and firefighting capabilities, and support public safety. Includes impending risks to impacted communities, public infrastructure, and national security concerns.</p>
 Food, Water, Shelter	<ul style="list-style-type: none"> Mass Care Services Logistics Management Supply Chain Management Infrastructure Systems 	<p>Support systems that enable the sustenance of human life, such as food retail and distribution networks, water treatment, transmission and distribution systems, housing, and agriculture resources.</p>
 Health and Medical	<ul style="list-style-type: none"> Public Health Healthcare Emergency Medical Services Fatality Management Services Environmental Response/Health and Safety Infrastructure Systems 	<p>Infrastructure and service providers for medical care, public health, patient movement, fatality management, behavioral health, veterinary support, and the medical industry.</p>
 Energy (Power & Fuel)	<ul style="list-style-type: none"> Infrastructure Systems 	<p>Electricity service providers and generation, transmission, and distribution infrastructure, as well as gas and liquid fuel processing, and delivery systems.</p>
 Communications	<ul style="list-style-type: none"> Operational Communications Infrastructure Systems 	<p>Infrastructure owners and operators of broadband internet, cellular and landline telephone networks, cable services, satellite communications services, and broadcast networks (radio/television). These systems encompass diverse modes of delivery, often intertwined but largely operating independently. Services include alerts, warnings, and messages, 911 and dispatch, and access to financial services.</p>
 Transportation	<ul style="list-style-type: none"> Critical Transportation Infrastructure Systems 	<p>Multiple modes of transportation that often serve complementary functions and create redundancy, adding to the resilience in overall transportation networks. This includes roadway, mass transit, railway, aviation, maritime, and intermodal systems.</p>
 Hazardous Materials	<ul style="list-style-type: none"> Environmental Response/Health and Safety Infrastructure Systems 	<p>Systems that mitigate threats to public health or the environment. This includes facilities that generate or store hazardous substances, as well as all specialized conveyance assets and capabilities to identify, contain, and remove pollution, contaminants, oil, or other hazardous materials and substances.</p>

*COMMUNITY LIFELINES | The manner emergency managers assess and prioritize employment of capabilities to achieve stabilization.

**CORE CAPABILITIES | An interoperable means to characterize capabilities that may be assessed, built, or validated during preparedness or applied to response operations.

Figure 5: Community Lifelines 1-7, Defined

The Energy Lifeline (Power and Fuel) provides vital power and/or fuel to all critical infrastructure. Energy is so heavily relied upon that a power interruption would substantially disrupt the security and resilience of other critical infrastructure sectors. In turn, the Energy Sector depends on many other critical infrastructure sectors, such as transportation, water, and communications.

A general outline of the interdependency among the lifeline functions is shown below in Table 1. The subsectors of electricity and fuel provide essential power and fuels to the Communication, Transportation, and Water Sectors. In return, both subsectors rely on them for fuel delivery (transportation), electricity generation (water for production and cooling), as well as control and operation of infrastructure (communication). Communication between these utilities is in accordance with the LUMA Major Outage Metrics, found in Appendix A of Annex A.











(Sub)sector Generating the Service	(Sub)sector Receiving the Service				
	Fuel 	Electricity 	Transportation 	Water 	Communication 
Fuel 		Fuel to operate power plant motors and generators	Fuel to operate transport vehicles	Fuel to operate pumps and treatment	Fuel to maintain temperatures for equipment; fuel for backup power
Electricity 	Electricity for extraction and transport (pumps, generators)		Power for overhead transit lines, traffic signals, and street lighting	Electric power to operate pumps and treatment	Energy to run cell towers and other transmission equipment
Transportation 	Delivery of supplies and workers	Delivery of supplies and workers		Delivery of supplies and workers	Delivery of supplies and workers
Water 	Production water	Cooling and production water	Water for vehicular operation; cleaning		Water for equipment and cleaning
Communication 	Breakage and leak detection and remote control of operations	Detection and maintenance of operations and electric transmission	Identification and location of disabled vehicles, rails and roads; the provision of user service information	Detection and control of water supply and quality	

Table 1: Interdependencies among Fuel, Electricity, Transportation, Water, and Communication

5.2 Risk Analysis of Community Lifelines

When stabilized, community lifelines are fundamental, integrated services that enable communities and governments to operate effectively and safely. When disaster strikes, it is important to identify which lifelines have been impacted, which lifelines need to be restored first, and what actions need to be taken to stabilize those lifelines.

Assessing these lifelines enables LUMA to identify which lifelines are most vulnerable to prioritize their resilience, ensuring greater life safety and protection of property and the environment, while enhancing the overall resilience of the T&D System. Further analysis and ties to critical loads are located within the Area Restoration Prioritization List section of the Major Outage Restoration Annex (Annex A).

Information sourced from the Puerto Rico Emergency Management Bureau (PREMB), 2019, identifies each hazard and the anticipated levels of vulnerability, consequences, and probability of the hazard occurring (see Table 2). This vulnerability assessment addresses Puerto Rico's lifeline vulnerabilities and assists LUMA in identifying the scale and complexity of a disaster, the lifelines it impacts, and the interdependencies of those impacts. Although it is not a complete gap analysis, this assessment further assists LUMA in developing operational priorities, objectives, response guidance, and public information and communication recommendations.

Due to its unique geographical characteristics, Puerto Rico is familiar with a variety of natural and man-made hazards that have the potential to affect or cause harm to life, property, and the environment.

Hazard	Vulnerability	Consequence	Probability
Flood	High	High	High
Severe Weather*	High	High	High
Earthquake	High	High	High
Tsunami	High	High	Moderate
Windstorm	Moderate	High	Moderate
Wildfire	Moderate	Moderate	Moderate
Lightning	Moderate	Moderate	Moderate
Landslide	Moderate	Moderate	Moderate
Dam/Levee Failure	Moderate	Moderate	Moderate
Infectious Diseases	Moderate	Moderate	Low – Moderate
Tornado	Moderate	Moderate	Low
Terrorism	Moderate	Moderate	Low
Expansive Soils	Low	Moderate	Moderate
Drought	Low	Low	Moderate – High
Extreme Heat	Low	Low	Moderate
Hailstorm	Low	Low	Low

*Includes hurricanes, tropical storms, and tropical depressions

Table 2: Hazards ranked by vulnerability, consequence, and probability from a utility perspective

5.2.1 Energy

The Energy Lifeline is fundamental to maintaining essential services. Storms often interrupt or damage electrical power generation, transmission, distribution infrastructure and operations. This creates hardship and often life-threatening situations for affected populations. In addition, the cascading impacts of power outages affect other critical response lifelines, causing further deterioration of conditions for survivors and complicating response efforts.

In 2020, a series of earthquakes caused power outages across Puerto Rico that lasted approximately 96 hours. These earthquakes also damaged the island's largest power plant, Costa Sur. On July 29th, 2020 (one day before Tropical Storm Isaias made landfall in Puerto Rico), 400,000 customers were left without power due to equipment failure. After Isaias made landfall, an additional 400,000 customers lost power (Associated Press, 2020).

Power Grid

Puerto Rico's power system includes ten fossil fuel and ten hydroelectric generation sites that are owned and operated by the Puerto Rico Electric Power Authority (PREPA), as well as privately-owned generation facilities consisting of a combined cycle gas turbine plant, a two-unit conventional thermal coal-fired plant, two wind farms, and seven solar farms. Hurricane season spans from June 1st to November 30th, a six-month period where Puerto Rico's electricity grid could be negatively impacted by tropical storms and hurricanes.

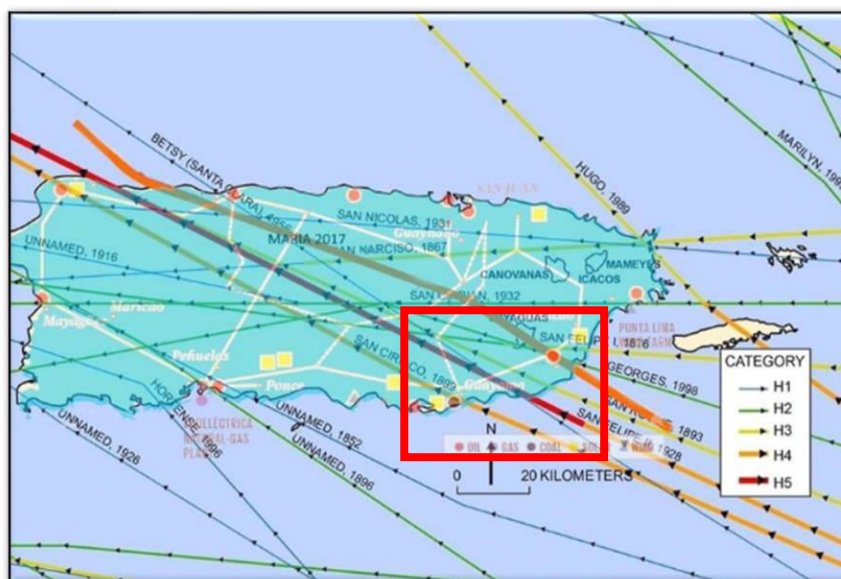


Figure 6: Historical hurricanes trajectories over the power generation layout of Puerto Rico

As shown in Figure 6, most of the hardest hitting hurricanes have made landfall on the southeast side of the island between the municipalities of Humacao and Guayama. This area is also home to several power generation plants, such as Central Aguirre, AES, Santa Isabel wind farm, and Humacao solar farm.

Puerto Rico is also surrounded by geological faults and some of them even cross over the island as shown in Figure 7. Up until July 2020, the Puerto Rico Seismic Network recorded over 10,000 earthquakes in the Puerto Rico region. The handful of earthquakes with a magnitude greater than 7.0 (per the Richter scale) have caused significant destruction to the island's infrastructure. An earthquake can also result in a tsunami. Tsunami waves in the Puerto Rico region could have an average height of 30 feet. A tsunami on the northern coast of the island could affect the Central San Juan, Palo Seco, and Cambalache power plants. A tsunami on the southern coast of the island could affect Costa Sur, Central Aguirre, AES, and EcoEléctrica.



Figure 7: Major geological faults overlapping the power generation layout of Puerto Rico

Another important part of electric utility maintenance is vegetation management. LUMA's Vegetation Management Plan includes steps to improve and maintain the control of vegetation to achieve a more resilient T&D System and support preparation for emergencies.

As the world witnessed in 2020 with the novel coronavirus disease (COVID-19), a pandemic can affect every facet of life. Although this type of hazard does not directly affect the power grid, it has the potential to greatly impact the workforce of LUMA. Any disaster event due to an outbreak, epidemic, or pandemic would require the modification or cancellation of staff assistance. The unavailability of personnel due to illness or quarantine could result in changes to operational practices necessitated by a pandemic.

Fuel

Transporting fuel across the island is a challenge in general. However, it becomes an even bigger challenge during a disaster or emergency event either due to a lack of fuel, the inability to import fuel, air/seaports being inoperable, and/or roads being impassable due to debris or flooding.

For a long time, customer-owned generators have been the only option for maintaining power and safety after a disaster, but they are a temporary lifeline at best. Essential businesses have the option to use much larger, diesel-powered backup generators however, neither of these generators is meant to be used for weeks on end. The larger generators require regular maintenance which could be on average every 500 hours as well as continuous refueling. If these two requirements are not met, generators can begin to fail.

Additionally, procuring a large amount of fuel is often impossible when ports are inoperable, and roads are impassable. After Hurricane Maria, some gas stations had a wait time of six hours or more, not because of a gas shortage but because of a transportation/distribution problem moving the gas from the piers to the gas stations. There were few available truck drivers, no fuel for the transport trucks, and impassable roads. As telephone communications systems became inoperable, drivers were unable to be reached and gas stations could not notify parent corporations of fuel outages.

5.2.2 Food, Water, Shelter

The Food, Water, Shelter Lifeline is a support system that enables the sustainment of human life, such as food retail and distribution networks, water treatment, transmission and distribution systems, housing, and agriculture resources. This Lifeline is made up of four components: Food, Water, Shelter, and Agriculture. Each of these components contains sub-components as shown in Table 3.

Food	Water	Shelter	Agriculture
<ul style="list-style-type: none"> Commercial Food Distribution Commercial Food Supply Chain Food Distribution Programs (e.g., food banks) 	<ul style="list-style-type: none"> Drinking Water utilities (intake, treatment, storage, and distribution) Wastewater Systems Commercial Water Supply Chain 	<ul style="list-style-type: none"> Housing (e.g., homes, shelters) Commercial Facilities (e.g., hotels) 	<ul style="list-style-type: none"> Animals and Agriculture

Table 3: Components and subcomponents of the Food, Water, Shelter Community Lifeline

Food

Contemporary supply chains are dependent on and usually interdependent with the electrical grid, telecommunications systems, road, and fuel networks. Grocers, for example, depend on power systems for lighting, payment processing, climate control, and refrigeration. If the electrical grid is down, the grocery stores need generators and a large amount of fuel. But first, the fuel needs to be transported from the port into the cities, and as outlined previously that may not be possible during an incident. About 85% of the total food consumed in Puerto Rico is imported, which creates a vulnerable food supply system (Garcia-Lopez, 2018). After Hurricane Maria, food imports accounted for 95% of the food on the island (Mares, 2019).

Water

The Puerto Rico Aqueduct and Sewer Authority (PRASA) owns and operates the island-wide public water and wastewater systems. There are approximately 50 wastewater and 100 drinking water treatment facilities located in Puerto Rico. Over 97 percent of Puerto Rico's population is served by PRASA's water system, and approximately 59 percent of the population receives service from PRASA's wastewater system (AAFAF, 2018). Those who do not receive their water services from PRASA still rely on power to utilize water. Several surface water and groundwater resources across the island provide residents with fresh water and are also used for agricultural, industrial, and energy-based purposes. The North Coast Karst Aquifer System of Puerto Rico is the island's most productive aquifer.

Approximately 30 days after Hurricane Maria, 36% of those connected to PRASA's water system were still without access to water, which equates to nearly one million people (Garcia-Lopez, 2018). The loss of electricity affects water pumping stations and lift stations, cutting off the water supply to residents. When water treatment plants lose power and/or do not function properly, drinking water becomes contaminated and it is difficult to comply with boil water notices without electricity.

Shelter

The FEMA Shelter Inventory Map identifies 452 shelters across the 78 municipalities in Puerto Rico (see Figure 8). During Hurricane Maria, approximately 12,000 people were in shelters across the island (Zorrilla, 2017). At a minimum, shelters need electricity to provide pressurized clean running water for basic hygiene needs, climate control, and lighting. Depending on shelter operations, electricity may also be required for the storage or preparation of food.

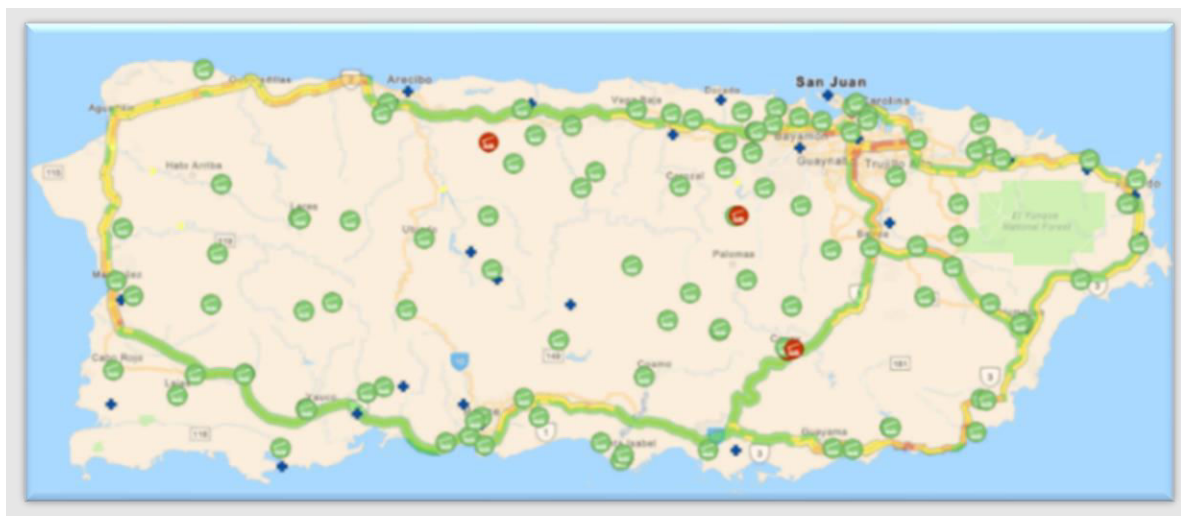


Figure 8: Map of shelters

(Source: Crowd Emergency Disaster Response Digital Corps, 2019)

Agriculture

Farms need a multitude of resources in order to continue operating, most of which are dependent on electricity. Fans and lights for the animals, fans to dry and remove grain dust in silos to prevent grain dust explosions, and machines for milking cows and processing milk are activities that require the power grid to remain operational. Dairy farmers are very important to the economy of Puerto Rico as they account for approximately a third of the total agricultural production on the island (Charles, 2017).

5.2.3 Transportation

The Transportation Lifeline encompasses multiple modes of transportation that often serve complementary functions and create redundancy, adding to the resilience of overall transportation networks. This includes roadway, mass transit, railway, aviation, maritime, and intermodal systems. This Lifeline is made up of five components: Highway/Roadway, Mass Transit, Railway, Aviation, and Maritime. Each of these components contains a number of sub-components as shown in Table 4.

Highway/Roadway	Mass Transit	Railway	Aviation	Maritime
<ul style="list-style-type: none"> Roads Bridges 	<ul style="list-style-type: none"> Bus Rail Ferry 	<ul style="list-style-type: none"> Passenger 	<ul style="list-style-type: none"> Commercial (e.g., cargo/passenger) General Military 	<ul style="list-style-type: none"> Waterways Ports and Port Facilities

Table 4: Components and subcomponents of the Transportation Community Lifeline

Reliable transportation is crucial to any economy. There are multiple modes of transportation on the island, all of which were severely affected by Hurricane Irma and Maria. This negatively impacted everyone; those who were trying to seek emergency assistance and medical care, travel to work or school, and find and reunite with loved ones.

Six million yards³ (162 million feet³) of debris were created by Hurricane Maria (Ecola et al., 2020), and at its peak, only 392 miles (630.9 km) of roadway were usable (Build Back Better, 2017). The passable roads did not have working traffic lights because of the nonexistence of power on the island (Ecola et al., 2020). Collectively, this made the immediate transportation of emergency workers, equipment, and other supplies nearly impossible. The lack of trucks, drivers, and fuel is a major logistical challenge in the restoration of power and the Energy Lifeline as a whole.

The “Tren Urbano” is the only active heavy-rail metro system serving the public in Puerto Rico. The system connects the cities of Bayamón, Guaynabo, and San Juan with 16 stations along a 10.7-mile (17.2 km) route (Build America Bureau, 2020). After Maria, this service was suspended for three months, and the public bus service was suspended for several weeks (Ecola et al., 2020).

The busiest airport in the Caribbean region is the Luis Muñoz Marín International Airport in San Juan (which is also utilized by the military), Rafael Hernández International Airport on the northwest side of the island, La Mercedita in Ponce, and Fernando Luis Ribas Dominicci, a single-runway airport in San Juan that supports three local airlines and private charters. Commercial airport operations ceased for several days during Hurricane Maria due to destruction and the downed power grid.

There is only one fully logistically operational port in Puerto Rico – the Port of San Juan. If the Port of San Juan is negatively impacted by a disaster, there is no way to receive equipment, supplies, and other mutual aid resources. It could take weeks or months to adequately prepare one or two additional ports like Ponce or Ceiba.

5.2.4 Communications

The Communications Lifeline is comprised of infrastructure owners and operators of broadband internet, cellular and landline telephone networks, cable services, satellite communications services, and broadcast networks (radio/television). These systems encompass diverse modes of delivery, often intertwined but largely operating independently. This Lifeline is made up of five components, as shown in Table 5.

Infrastructure	Responder Communications	Alerts, Warnings, and Messages	Finance	911 and Dispatch
<ul style="list-style-type: none"> Wireless Cable Systems and Wireline Broadcast (TV and Radio) Satellite Data Centers/Internet 	<ul style="list-style-type: none"> LMR Networks 	<ul style="list-style-type: none"> Local Alerts/Warning Ability Access to IPAWS (WEA, EAS, NWR) NAWAS Terminals 	<ul style="list-style-type: none"> Banking Services Electronic Payment Processing 	<ul style="list-style-type: none"> Public Safety Answering Points Dispatch

Table 5: Components and subcomponents of the Communications Community Lifeline

During a disaster, any and all methods of communication can suddenly become non-operational. When the Energy Lifeline is negatively impacted, the infrastructure the public utilizes daily to receive and send information can become practically obsolete. In the aftermath of Hurricane Maria, the only sources of communication the public received information from were two local AM radio stations (Zorrilla, 2017; Bell, 2018). Radio might be the most reliable way of communication during a disaster when the electrical grid, internet, and cell service are all down (Venton, 2019).

It is for this reason that the American Red Cross (ARC) recommends all disaster kits include a battery-powered radio (ARC, 2021). Though often overlooked, the AM/FM radio can be a critical channel to transmit mass messaging in a major disaster. With the preparation of backup power and a reinforced antenna, the radio can become an avenue for the constant flow of up-to-date information. These messages that can calm anxieties (Bell, 2018) and help communicate information to the public about LUMA's emergency response.

Communication with the public is a critical component of effective disaster preparedness, mitigation, response, and recovery (Andrade et al., 2020). LUMA maintains communications with the public and local governments regarding outages and estimated times of restoration using customer notification systems, public messaging using media outlets, and other communications resources.

Internal communications are also vital to emergency response and restoration operations. Communication networks are critical to LUMA's operations as the LEOC must have the ability to disseminate information between the customer call center, all EOCs, regional operations teams, elected officials, and all other resources deemed necessary.

Being able to call 911 during or after a disaster is nothing less than a necessity. During Hurricane Maria, the emergency communications system failed across the island. Due to landlines and cell service being non-operational, many callers could not reach 911. The dispatchers who were able to connect with the public were not able to communicate with police stations, and therefore it took a long time for emergency workers to arrive in response to a call. Public land mobile radio (LMRs) systems are utilized by public safety organizations like police, fire, ambulance services, and other governmental organizations.

Handheld portable radios normally have a limited transmission range. In contrast, mobile radios in first responder vehicles use the vehicle's power supply and have a bigger antenna that increases the transmission range, making them usable during a power outage (SAFECOM, 2016).

5.2.5 Hazardous Materials

The Hazardous Materials Lifeline is a support system that enables the sustainment of human life, such as food retail and distribution networks, water treatment, transmission and distribution systems, housing, and agriculture resources. This Lifeline is made up of two components: Hazardous materials (HAZMAT) and the facilities that house them. Each of these components contains sub-components, as shown in Table 6.

Facilities	HAZMAT, Pollutants, Contaminants
<ul style="list-style-type: none"> Oil/HAZMAT Facilities (e.g., chemical, nuclear) Oil/HAZMAT/Toxic Incidents from Facilities 	<ul style="list-style-type: none"> Oil/HAZMAT/Toxic Incidents from Non-Fixed Facilities Radiological or Nuclear Incidents

Table 6: Components and subcomponents of the Hazardous Materials Community Lifeline

Following Hurricane Maria, the United States Environmental Protection Agency (EPA) deployed more than 100 community involvement coordinators to assist residents and local municipalities with the collection of household hazardous materials. They collected almost 60 tons of solid hazardous waste and hundreds of gallons of liquid hazardous waste for shipment and disposal off-island. Additionally, they assessed 177 chemical and hazardous waste and oil facilities in Puerto Rico. The EPA did not identify any major spills or releases from these facilities associated with the effects of Hurricane Maria (Environmental Protection Agency, 2018). The Caribbean has only one nuclear reactor which operates in Jamaica (Power Technology, 2020).

5.2.6 Health and Medical

The Health and Medical Community Lifeline is comprised of the emergency medical services and acute medical care needed to meet the immediate lifesaving and life-sustaining needs of survivors. As the medical care facilities are restored to normal capabilities, behavioral health services and public health operations support longer-term survivor needs. This Lifeline is made up of five components, as shown in Table 7 below.

Medical Care	Public Health	Patient Movement	Medical Supply Chain	Fatality Management
<ul style="list-style-type: none"> Hospitals Dialysis Pharmacies Long-Term Care Facilities VA Health System Veterinary Services Home Care 	<ul style="list-style-type: none"> Epidemiological Surveillance Laboratory Clinical Guidance Assessment/Interventions/Treatments Human Services Behavioral Health 	<ul style="list-style-type: none"> Emergency Medical Services (EMS) 	<ul style="list-style-type: none"> Blood/Blood Products Medical Saline Medica Manufacturing (Pharmaceutical, Device, Medical Gases) Distribution Critical Clinical Research Sterilization Raw Materials 	<ul style="list-style-type: none"> Mortuary and Post-Mortuary Services

Table 7: Components and subcomponents of the Health and Medical Community Lifeline

A disaster may result in an increase of diseases from the lack of sanitation, increased pressure on the healthcare system, and loss of healthcare facilities due to damage and inoperability. During Hurricane Maria, the majority of the island's 69 hospitals were left without electricity or fuel for generators. A few days after Maria made landfall, only three major hospitals were able to function. Still, as communication systems had not yet been restored, hospitals and staff were unable to communicate with each other (Zorrilla, 2017). FEMA's planning assumption for the percentage of hospitals in Puerto Rico that would be impacted by hurricanes in 2017 was 56%, but the actual percentage of hospitals impacted was 92% (FEMA, 2018).

Stabilization of the Health and Medical Community Lifeline after a disaster is dependent on the stabilization of the other lifelines. Hospitals are dependent on power, potable water, operable wastewater systems, and adequate communications to support an affected population. Hospitals require various chemicals and the ability to remove waste to maintain their core operations.

This lifeline is considered stabilized after all survivors, along with their pets and service animals, are able to access medical and veterinary care. Movement of patients, access to public health services, fatality management support (even if temporary), and stable medical supply chains are all signs of stabilization of the Health and Medical Lifeline.

5.2.7 Safety and Security

The Safety and Security Lifeline is a support system that enables the sustainment of human life through first responder and government services, law enforcement, and community safety programs. This Lifeline is made up of five components: Law Enforcement Safety, Fire Services, Search and Rescue, Government Service, and Community Safety. Each of these components contains sub-components, as shown in Table 8.

Law Enforcement/ Security	Fire Service	Search and Rescue	Government Service	Community Safety
<ul style="list-style-type: none"> • Police Stations • Law Enforcement • Site Security • Correctional Facilities 	<ul style="list-style-type: none"> • Fire Stations • Firefighting Resources 	<ul style="list-style-type: none"> • Local Search and Rescue 	<ul style="list-style-type: none"> • Emergency Operation Centers • Essential Government Functions • Government Offices • Schools • Public Records • Historic/Cultural Resources 	<ul style="list-style-type: none"> • Flood Control • Other Hazards • Protective Actions

Table 8: Components and subcomponents of the Safety and Security Community Lifeline

As discussed in the Communications Lifeline section, being able to contact response personnel is always a necessity, but it is possibly even more important during an emergency event. But before response personnel can be contacted, they must be available, correctly equipped, and ready to deploy. Search and rescue assets should be sufficient to assist all survivors. Fire suppression resources and personnel may assist in emergencies for more than just those that involve a fire.

Threats to life safety are concerns for all response personnel and impacted communities. Each of these subcomponents of the safety and security lifeline is imperative. When essential government functions can operate, immediate and long-term recovery from an emergency event is easier.

All safety incidents are included in a safety report per LUMA Health Safety Environment & Quality (HSEQ) standards and in accordance with the LUMA Major Outage Metrics found in Appendix A of Annex A.

6 Concept of Operations

6.1 General

In the event of an emergency, LUMA assesses the impacts on the T&D infrastructure. After the assessment, LUMA takes the necessary actions to restore community lifelines as rapidly as possible and minimize the impact on the citizens of Puerto Rico. LUMA utilizes Event Classification Types (Appendix A) for major events and phases of response.

6.2 Plan Activation

The effective and timely activation of emergency response personnel is critical to the success of the response. During significant emergencies, LUMA may activate the Crisis Management Committee (CMC), Command Staff, and General Staff island-wide to support the needs of the response effort. An emergency shall be declared by the LUMA Chief Executive Officer (CEO) or his/her designee when natural, human, or technological disasters threaten to produce conditions that result in a substantial impact to T&D operations.

6.2.1 Organization Activation

If it is not possible to effectively manage the disaster through normal operating procedures, the LUMA Energy Emergency Response Organization (ERO) is activated at the direction of the LUMA CEO. Due to the size and nature of the activation process, it is intended to be a cascading one to maximize response efficiency and consistency.

The LUMA Incident Commander (IC), or his/her designee, shall subsequently establish a LEOC Activation Level and Event Classification Type relative to the type and complexity of the outage event, resources that may be needed, and the expected impacts of the event. The IC then determines the required Command and General Staff needed to activate the LEOC. Note that ROCCs may be activated to manage local issues without direction from the CEO or IC but this is not considered ERO activation.

6.2.2 Decision Methodology

The emergency response process begins with an evaluation of system conditions that contribute to identifying the Event Classification Type and/or LEOC Activation Level.

Criteria may include weather forecasts, number of customers projected to be impacted, estimated damage to the T&D system, and estimated impacts to community lifelines and critical infrastructure. The criteria in Appendix A and Annex A are used to help establish the level of emergency response needed; the mobilization of the ERO and the activation of associated resources including mutual assistance support. It is important to re-evaluate the LEOC Activation Level and Event Classification Type every 12-24 hours, at a minimum.

The order of determining a LEOC Activation Level and an Event Classification Type may be dependent on if the cause of the activation is a forecasted potential incident or a no-notice incident.

6.2.3 Forecasted Potential Incidents and Scheduled Events

Forecasted potential incidents allow for a preparedness window before the incident happens to posture the organization for a response. Most of the time these incidents are atmospheric and are forecasted (e.g., hurricanes, rainstorms). Forecasted events, such as scheduled protests, sporting events, conventions, etc., also have the potential to result in an unplanned incident.

For a forecasted potential incident, the determination of an LEOC Activation Level is typically needed first, followed by the establishment of an Event Classification Type. An Event Classification Type may be chosen once an incident starts to negatively affect any part of the T&D System (e.g., when the hurricane starts to make landfall).

The Crisis Management Department, T&D Operations, and others consistently monitor weather forecasts. When it is determined that the forecast is problematic, an alert is sent to the appropriate key response members to discuss initial coordination activities. LUMA personnel uses weather data and other information to make the determination of which Event Classification Type is likely and which area(s) the company can expect impact. This team of individuals include Crisis Management, T&D Operations, and others. It may also include input from a third-party weather service provider in addition to the National Weather Service to support their decision(s).

For major forecasted events, Event Types 1, 2, and 3 (such as a major hurricane), there is typically a multiple-day advance notice. In these cases, if imminent, LUMA activates aspects of the appropriate response as outlined within this ERP. Preparation for such events is supported by reviewing the H-120 Timeline checklist (Appendix B) to ensure daily progress is met against the planned response.

More problematic events are those that start or are estimated to be an Event Type 4 and escalate to an Event Type 3 or higher. This ERP allows for response to such events by a series of protocols that activate all functions under the Incident Command System.

If it is determined that a minor event is likely (Event Types 4-5), LUMA manages the event through normal operational procedures. If the event escalates, protocols are in place to activate the LEOC. If it is predicted to be an emergency event (Event Types 1-3), LUMA implements its pre-event protocols and activities under the ICS structure as appropriate. The ERP allows for scalability, rapid escalation, or de-escalation, as needed.

Pre-event planning activities include, but are not limited to:

- Identifying the IC and LEOC Activation Level and Event Classification Type for the incident
- Initiating pre-event system conference call(s) with all required personnel
- Activating each required section under ICS, including Operations, Logistics, Planning and Intelligence, Public Information Officer, Finance/Admin, and Liaison Officer, and implementing notifications for internal personnel to the extent needed
- Reviewing the appropriate guides, checklists, plans, and procedures
- Acquiring the estimated resource requirements necessary for the assigned event type, including mutual aid requests and contingency plans if those items are unavailable
- Initiating preliminary communications to the public, Lifeline Residential Service (LRS) Customers, municipal and elected officials, including required notifications to regulatory agencies (Pre-Event Reporting) if classified as an Event Type 1-3
- Mobilizing the LEOC, ROCCs and other required Operations Section Branches as appropriate for the event type assigned
- Initiating notifications to external providers such as staging site property owners, suppliers, contractors, etc. where necessary

6.2.4 No-Notice Incidents

A no-notice incident occurs unexpectedly or with minimal warning (e.g., earthquakes, tsunamis, chemical spills, terrorist attacks). **For a no-notice incident, the determination of an Event Classification Type is typically needed first, followed by the establishment of the LEOC Activation Level.** The lack of warning and the quick response time required introduce distinct challenges.

No-notice incidents do not provide emergency responders sufficient time to prepare for the specific incident. This greatly affects LUMA's ability to pre-position needed assets and resources as well as warn and direct the public.

If it is determined that a minor event is likely (Event Types 4-5), LUMA manages the event through normal operational procedures. If the event escalates, protocols are in place to activate the LEOC. If it is predicted to be an emergency event (Event Types 1-3), LUMA implements its pre-event protocols and activities under the ICS structure as appropriate. The ERP allows for scalability, rapid escalation, or de-escalation, as needed.

Pre-event planning activities include, but are not limited to:

- Identifying the IC and LEOC Activation Level and Event Classification Type for the incident

- Initiating pre-event system conference call(s) with all required personnel
- Activating each required section under ICS, including Operations, Logistics, Planning and Intelligence, Public Information Officer, Finance/Admin, and Liaison Officer, and implementing notifications for internal personnel to the extent needed
- Reviewing the appropriate guides, checklists, plans, and procedures
- Acquiring the estimated resource requirements necessary for the assigned event type, including mutual aid requests and contingency plans if those items are unavailable
- Initiating preliminary communications to the public, Lifeline Residential Service (LRS) Customers, municipal and elected officials, including required notifications to regulatory agencies (Pre-Event Reporting) if classified as an Event Type 1-3
- Mobilizing the LEOC, ROCCs, and other required Operations Section Branches as appropriate for the event type assigned
- Initiating notifications to external providers such as staging site property owners, suppliers, contractors, etc., where necessary

6.3 LUMA Event Classification Type

All potential events (natural, man-made, and technological), with the potential to affect LUMA T&D System Operations are assigned an Event Classification Type by the IC or designee. The IC is responsible for analyzing the severity and complexity of the incident, with the collaboration and input of the Command and General Staff. This analysis assists in identifying resource requirements and positions needed for a LEOC activation at all levels of the ERO. This analysis typically begins in the pre-event stage and continues every operational period throughout the service restoration stage for restoration events. It is during this analysis that the IC determines the Event Classification Type. The Event Classification Types are **not** directly tied to the establishment of LEOC Activation Levels (refer to Appendix A).

The IC may also deem it necessary to escalate or de-escalate the Event Classification Type and LEOC Activation Level depending on changes in circumstances or where actual conditions differ from expected conditions. The Event Classification Type depends upon the analysis of the expected severity and complexity of an event and is drawn from the consideration of numerous factors including, but not limited to:

- Life safety
- Current and forecasted weather conditions
- Certainty and plausibility of weather forecast and scenarios
- Size of the anticipated incident and expected impacts on T&D system operations
- Anticipated type and extent of potential or known damage
- Historical experience with other events
- Level of command anticipated or required to direct restoration efforts
- Current operational situation (number of outages, resources, supplies, etc.)
- Damage assessments
- Restoration priorities
- Forecasted or actual resource requirements
- Availability and logistical considerations of supplemental resources
- Forecasted operational tempo

Five (5) event types have been established. Types Five (5) and Four (4) are considered Non-Emergency Events. They are restoration events managed as normal operations and/or an isolated event that does not necessitate the activation of the LEOC unless escalation occurs.

Types One (1), Two (2), and Three (3) are Emergency Events with Type Three (3) being the less severe and Type One (1) representing catastrophic emergency conditions. They are as follows:

6.3.1 Type 5: Non-Emergency Event – Normal Day to Day Operations

Type 5 events represent normal operations and are managed by the Operations Dispatch Organization which is staffed 24/7/365. For small outages, Operations dispatches designated trouble resources to repair the outage. If upon arrival the Trouble Shooter determines additional resources are needed, a supervisor is assigned and secures additional line crews from the Field Operations organization.

6.3.2 Type 4: Non-Emergency Event – Heightened Alert

These events typically include system events that impact one or more districts. Type 4 events may be due to thunderstorms, high winds, frequent and/or severe lightning, small to moderate winter storms or unanticipated events. Typically, these events are managed by System Operations with assistance from Field Operations. Control and management of the event typically remain centralized but may decentralize to one or more ROCCs depending on the damage.

6.3.3 Type 3: High Alert Event (Moderate Regional Event)

A Type 3 event historically resulted in significant damage to district(s) or moderate damage to a region(s). The approach is to prepare for more than one region to potentially be impacted by activating the ICS structure and opening one or more ROCCs. This type of event is coordinated locally through daily Incident Command meetings/conference calls to coordinate pre-planning activities in advance of the event, restoration activities during the event, and demobilization activities post-event.

6.3.4 Type 2: Emergency Conditions

A Type 2 event is a severe event that has historically resulted in significant damage to the electrical transmission and distribution system in a region(s) or could be moderate damage across the entire island. This is a full implementation of ICS, and most employees are assigned shifts and schedules related to their role in this ERP.

6.3.5 Type 1: Catastrophic Emergency

A Type 1 event is a catastrophic event, historically resulting in significant damage to the electrical transmission and distribution system or a widespread outage. Type 1 events are rare but are usually forecasted in advance of the event. This event calls for the full implementation of ICS with a LEOC activation of Level 1. All employees are assigned shifts and scheduled in relation to their role in the ERP. All ROCCs are activated.

Additional details regarding Event Classification Types related to electrical outages can be found in Annex A — Major Outage Restoration Annex, Section 7.2.

6.4 LUMA Emergency Operations Center Activation

The LEOC operates within five (5) activation levels that increase the intensity from Level 5 to a Level 1 with a Level 1 activation being the highest and most resource-intensive (see Appendix A). Depending on the outage event or incident, either an Event Classification Type is determined or LEOC Activation Level is established with recommendations from Crisis Management. The LEOC Activation Levels may increase or decrease due to the complexity of the incident. The IC determines the level of command and general staff to activate in response to the incident.

6.4.1 Level 5 – Normal Operations

Daily operations are being performed across the organization. Staff perform day-to-day routine evolutions and maintain situational awareness by observing the changing and predicted weather conditions and the news for any event that may adversely affect operations.

6.4.2 Level 4 – Heightened Alert

Conditions are developing (e.g., severe weather such as torrential rains or a tropical weather system) that could present a potential risk to the T&D System soon. Therefore, a heightened level of situational awareness and monitoring is implemented with more frequent communications taking place among decision-makers. Partial activation is likely with only those positions necessary, i.e., Public Information Officer, Emergency Management Officer, and Liaison Officer. Internal conference calls may be scheduled regarding preparation for a future weather event. This can also be indicative of an isolated non-weather incident at a LUMA facility or other property.

6.4.3 Level 3 – High Alert

Some day-to-day tasks and operations may be suspended or redirected. Mobilization of internal resources and partial acquisition / mobilization of external resources is considered. Incident Command for the LEOC is established with necessary positions and may be dependent on the activation of and impacts on one or multiple ROCCs.

Institutional knowledge, system performance metric indicators and forecast confidence levels are utilized to determine a pre-event approach. Emergency response communication protocols are activated at the direction of the PIO with notifications being made to Lifeline Residential Service (LRS) Customers; Municipal, Regulatory, and Elected Officials; and LUMA staff. Pre-event Stage Reports, Restoration Stage Reports (RSRs), and Incident Action Plans (IAPs) are developed/submitted.

6.4.4 Level 2 – Emergency Conditions

Emergency event conditions are imminent and may cause significant impacts on LUMA operations. If the conditions are due to a severe forecasted weather event, ROCCs are already activated and potentially the full ICS structure is activated at the LEOC to support response and restoration activities. Conference calls and meetings are conducted to coordinate response activities as well as operational period briefings are conducted at the beginning of each operational period. It is likely mutual aid is requested and agreements activated. Emergency response communication protocols are activated to include Public Service Announcements (PSAs), online Outage Center, social media, e-mail/call blast messages, etc. Government of Puerto Rico and Federal level coordination may be required with Liaisons assigned, as appropriate.

6.4.5 Level 1 – Catastrophic Emergency

Emergency conditions are imminent that will likely cause or have caused a catastrophic impact. ROCCs are activated, and the full ICS structure is activated at the LEOC to support response and restoration activities. This is a full implementation of ICS, and most employees are assigned shifts and scheduled related to their ICS role.

Resources are needed, prompting mutual aid to be requested with all available agreements activated. Conference calls and meetings are conducted to coordinate response activities as well as operational period briefings are conducted at the beginning of each operational period. All emergency response communications protocols are activated to include those listed under a Level 2 activation. Government of Puerto Rico and Federal level coordination is likely required with Liaisons assigned, as appropriate.

Advance notice may be given with a severe weather threat such as a Category 1-5 hurricane. Still, events such as an earthquake may immediately initiate a LEOC activation to a Level 1 based on the severity of the earthquake and the level of system impact.

Table 9 provides a summary of the key activities that are associated with each LEOC activation level.

LEOC Activation Level	Normal Operations (Level 5)	Heightened Alert (Level 4)	High Alert (Level 3)	Emergency Conditions (Level 2)	Catastrophic Emergency (Level 1)
Situational awareness of resources	Y	Y	Y	Y	Y
Activation of the ERP and Incident Command		P	Y	Y	Y
Activation of the LEOC			P	Y	Y
Mobilization of resources		P	P	Y	Y
Notifications to Stakeholders		P	Y	Y	Y
Government of Puerto Rico and/or Federal Assistance Needed				P	Y
Y – Yes; P – Probable					

Table 9: LEOC activation level key activities

6.5 PREMB Event Classification

While LUMA maintains Event Classification Types and LEOC Activation Levels, PREMB also has a set of established incident levels (the equivalent of LUMA types) and EOC activation levels. To reduce confusion and aid in the alignment of response and restoration efforts, each EOC Activation Level and event/incident type has been aligned between LUMA and the Puerto Rico Emergency Management Bureau (PREMB). The scope and scale of the Government of Puerto Rico support depends on the impacts, scope, scale, and complexity of the incident. PREMB classifies events using the nomenclature 'incident level' (PREMB & DPS, 2021). PREMB's incident levels align with FEMA's and refer to the level at which PREMB employs Government of Puerto Rico resources to achieve jointly developed incident objectives.

Incident levels classify an incident based on its actual or anticipated impact, size, and complexity as well as the PREMB assistance required. The PREMB Commissioner, PREMB Deputy Commissioner, and Secretary of the Department of Public Safety coordinate with the Governor on designating incident levels and adjusting designations as the magnitude and complexity of the incident change.

6.5.1 Level III: Minor Incidents

- A disaster that, due to its severity, size, location, and actual or potential impact on public health, welfare, and infrastructure, requires a moderate amount of Government of Puerto Rico support.
- A disaster requiring maximum recovery efforts and minimal response efforts, which existing PREMB resources can meet.
- A disaster requiring coordination among the involved Government of Puerto Rico and local entities due to minimal to average levels of damage.
- PREMB assistance may be limited to the activation of only one or two ESF primary agencies.

6.5.2 Level II: Moderate to Major Incidents

- A disaster that, due to its severity, size, location, and actual or potential impact on public health, welfare, and infrastructure, requires a high amount of direct Government of Puerto Rico assistance for response and recovery efforts.
- A disaster requiring elevated coordination among PREMB and whole community entities due to the moderate scale and breadth of damage.

- Significant involvement of PREMB, other Government of Puerto Rico agencies, and ESF supporting agencies activated to support the EOC, and possible deployment of initial response resources are required to support requirements.

6.5.3 Level I: Catastrophic Incidents

- A disaster resulting in mass casualties, extraordinary levels of damage, or disruptions that severely affect the population, infrastructure, environment, economy, public morale, and/or government functions.
- A disaster of such magnitude that the available resources in place for the response are completely overwhelmed or broken at the local, municipality, and commonwealth levels.
- Due to its severity, size, location, and actual or potential impact on public health, welfare, and infrastructure, a disaster requiring a great amount of direct PREMB assistance for response and recovery efforts, for which the support capabilities do not exist at any level of government.
- Requires extraordinary coordination among Federal, Government of Puerto Rico, and local entities, due to the massive levels and the breadth of the damage, the severity of the impact, and the multi-island scope of the incident.
- The major involvement of the Government of Puerto Rico, all coordinating and primary emergency support function (ESF) agencies, and possible FEMA Region II is needed to support the requirements of the affected jurisdictions.

6.6 Critical Infrastructure and Facilities Restoration Prioritization

LUMA understands the challenges and potential disruption to its customers' lives resulting from electrical outages. LUMA strives to restore power to all customers in the safest and most expedient manner possible. In support, LUMA Operations utilizes a priority matrix system, during both normal and emergency operations, which provides the most efficient approach to restoring electrical outages. All outages are prioritized using a variety of factors including, but not limited to, community lifelines, customer type, number of affected customers, and outages involving safety conditions.

The Cybersecurity and Infrastructure Security Agency (CISA), under Presidential Policy Directive 21 (PPD-21): Critical Infrastructure Security and Resilience, the Energy Sector is identified as uniquely critical because it provides an “enabling function” across all critical infrastructure sectors. Under this guidance, LUMA has developed a hierarchy of critical infrastructure and facilities, prioritized as Levels 1, 2, and 3, used to categorize various facilities based on the principles of community lifelines discussed in Section 5.

6.6.1 Critical Infrastructure

According to CISA, these critical infrastructure sectors have assets, systems, and networks, both physical and virtual, that are considered so vital to the United States that their incapacitation or destruction would have a debilitating effect on security, economic security, national public health or safety, or any combination thereof (CISA, 2020).

Throughout Puerto Rico, there are many critical infrastructure vulnerabilities. The loss of power to critical infrastructure such as chemical and industrial plants, sewer lines, and water treatment and distribution systems may result in severe environmental and public health hazards to the population.

6.6.2 Critical Facilities

Typical critical facilities include hospitals, fire stations, police stations, storage of critical records, and similar facilities (FEMA, 2020). These facilities should be given special consideration when formulating emergency response and restoration protocols. See Appendix C for a list of Critical Facilities.

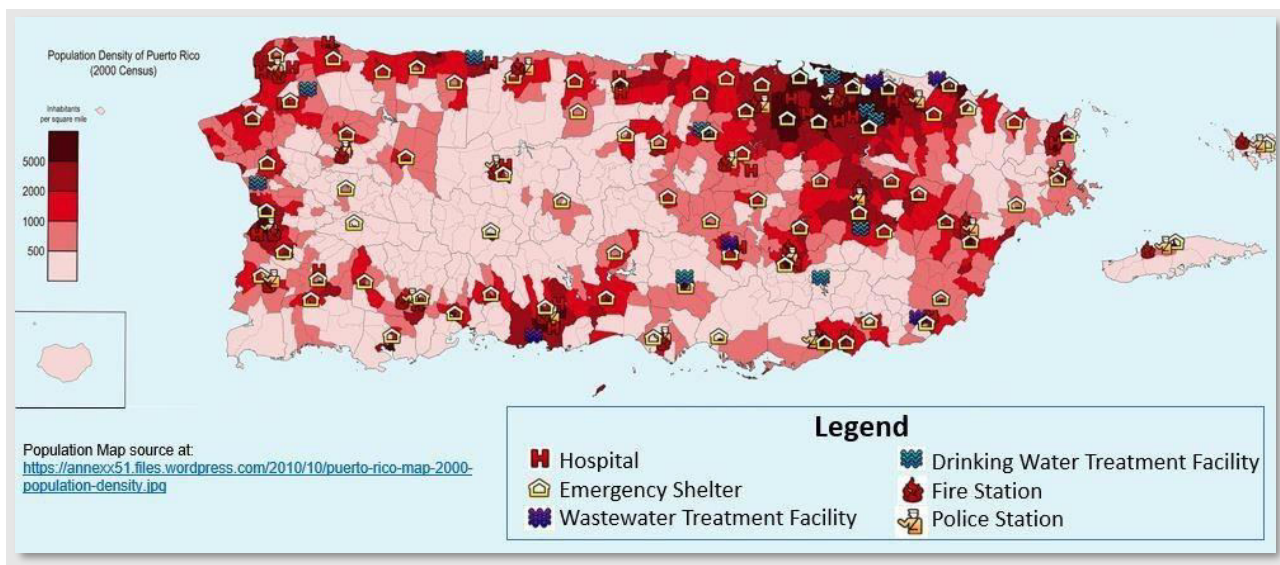


Figure 9: Generalization of critical infrastructure, facilities, and population density in Puerto Rico
(Source: Report: Build Back Better: Reimagining and Strengthening the Power Grid of Puerto Rico)

Per the American Hospital Directory (2020), there are 58 non-federal, short-term, or acute care hospitals. Of those, only one is a Level 1 trauma center. There are approximately 84 fire stations (FireCARES, 2020) and 13 jurisdictional regions in the Puerto Rico Police Bureau (United States, 2011). The FEMA Shelter Inventory Map identifies 452 shelters across the 78 municipalities in Puerto Rico. Figure 9 depicts a generalized map of this infrastructure.

Level 1

Critical infrastructure and facilities identified as Level 1 facilities provide services that are *critical* to the health and safety of the public and are tied to at least one of the seven critical community lifelines. These facilities include, but are not limited to the following:

- Hospitals and Emergency Medical Facilities
- Emergency Shelters, Cooling Centers, and Rescue Facilities
- Public Safety Entities: Fire, Police, and Paramedics
- Emergency Management Offices and Emergency Operations Centers
- Water Pumping/Lift Stations and Wastewater Treatment Plants
- Critical Utility and Communications Facilities
- Fuel Transfer and Fuel Loading Facilities (ports)
- Mass Transit (tunnels, bridges, ferry terminals, major rail facilities/rectifier stations)
- Airports
- Military Bases
- Critical Flood Control Structures

Level 2

Critical infrastructure and facilities identified as Level 2 facilities provide *significant* public services and may include some of the same facilities described in Level 1 depending on the event type. These are considered less critical by government agencies and include, but are not limited to the following:

- Nursing Homes and Dialysis Centers
- Facilities to support other critical government functions
- Prisons and Correctional Facilities
- Communications (radio, TV, etc.)

Level 3

Critical infrastructure and facilities identified as a Level 3 facilities provide *some* public services. Depending on the event type, they may include some of the same type of facilities described in Level 2. They include, but are not limited to the following:

- Event Specific Concerns
- High-Rise Residential Buildings
- Customers providing key products and services (food warehouse)
- Managed Accounts, Large Employers, and Other Key Customers
- Prioritization Other Government Buildings, Schools, and Colleges

6.6.3 Restoration Prioritization

Outages are prioritized by considerations of safety conditions, type, the number of damages to the system, critical Community Lifelines, customer type, and the number of affected customers. The designation of critical infrastructure or facilities within level 1, 2, or 3, however, does not guarantee or prioritize their restoration after a major event. SERTs address emergency and life-threatening conditions reported as a priority, such as public safety hazards or downed wires. Restorations occur in accordance with the LUMA Major Outage Metrics, found in Appendix A of Annex A. LUMA prioritizes actions that have the greatest gain for the overall T&D System stability and the greatest benefit for all customers.

7 Organization and Assignment of Responsibilities

7.1 Emergency Response Organization

The LUMA Emergency Response Organization (ERO) is designed to enable effective and efficient emergency management and coordination that is both internal and external to LUMA through a flexible and standardized management structure that is scalable. Therefore, it can be utilized during all emergencies, from day-to-day operations to a large-scale disaster. The ERO required to implement the emergency procedures is specified by the organizational chart included in Appendix A. The ERO is aligned with the National Incident Management System (NIMS) and utilizes an Incident Command System (ICS) structure. The utilization of ICS establishes lines of a supervisory authority and formal reporting relationships that define clear lines of communication between different functional groups. This approach results in a reasonable span of control within each group of the operation.

Immediately upon declaration of an emergency, the required Emergency Operations Centers (EOCs) shall be activated at the request of the incident commander at a minimum. At times, it may be desirable to staff the EOC(s) and place other personnel on stand-by prior to the actual event when possible. The number of EOC personnel and mobilized resources are dependent upon the size, scale, and complexity of the emergency event in accordance with the LUMA Major Outage Metrics, found in Appendix A of Annex A. There are three defined levels to the ERO. They are Strategic, Operational, and Tactical and can be defined as:

- **Strategic Level:** Provides LUMA's strategic guidance for response to the LEOC staff as the LUMA CMC. The strategic level does not direct the emergency response or tactical operations.
- **Operational Level:** Develops LUMA's response to the emergency and oversees the implementation of the Incident Action Plan (IAP). This group forms the LEOC staff and can include the ROCCs when activated.

- **Tactical Level:** Implements LUMA's response to the emergency and reports to the ROCCs, when activated, and/or the LEOC. This group is composed of the SERTs, damage assessment teams, and others.

The LUMA ERO organizational charts can be found in Appendix A and the Position Descriptions can be found in Appendix B.

7.2 Agency Representatives

LUMA coordinates with multiple external agencies through their respective emergency activation processes. The liaisons and their responsibilities for these agencies include, but are not limited to:

- PRASA Liaison Officer (PSLNO)
- PREPA Liaison Officer (PRLNO)
- PREPA Generation Liaison Officer (PLO)

7.2.1 PRASA Liaison Officer

The PRASA Liaison Officer (PSLNO) serves as a point of contact between PRASA and LUMA. They speak on behalf of LUMA at operational period briefings and assist in answering information requests from PRASA. The PRLNO works closely with the LUMA Liaison Officer (LNO) to ensure continuity of messaging and to keep the LEOC informed as to the information being shared in the PRASA EOC.

The primary responsibilities of the PSLNO include, but are not limited to:

- Build and maintain relationships with PRASA stakeholder during blue sky days.
- Ensure an open communication channel between LUMA and PRASA during an incident.
- Provide the requested information and status updates regarding LUMA operations to PRASA.
- Conduct routine PRASA contact lists. Ensure contact lists are maintained through the effective usage of a variety of computer software applications including Outlook, SharePoint, databases, spreadsheets, and others.
- Ensure unity of messaging from LUMA to PRASA.
- When activated, work out of the PREMB EOC, and liaise with the LEOC.

7.2.2 PREPA Liaison Officer

The PREPA Liaison Officer (PRLNO) serves as a point of contact between PREPA and LUMA. They speak on behalf of LUMA at operational period briefings and assist in answering information requests from PREPA. The PRLNO works closely with the LNO to ensure continuity of messaging and to keep the LEOC informed as to the information being shared in the PREPA EOC.

The primary responsibilities of the PRLNO include, but are not limited to:

- Build and maintain relationships with PREPA stakeholders during blue sky days.
- Ensure an open communication channel between LUMA and PREPA during an incident.
- Provide the requested information and status updates regarding LUMA operations to PREPA.
- Conduct routine maintenance of PREMB contact lists. Ensure contact lists are maintained through the effective usage of a variety of computer software applications including Outlook, SharePoint, databases, spreadsheets, and others.
- Ensure unity of messaging from LUMA to PREPA.
- When activated, work out of the PREMB EOC and liaise with the LEOC.

7.2.3 PREPA Generation Liaison Officer

The PREPA Generation Liaison Officer (PLO) serves as the information conduit between LUMA and PREPA on generation and restoration activities. They develop and activate mutual aid and contingency contracts that are currently held by PREPA, including mutual aid agreements such as those held with American Public Power Association (APPA), in addition to the PREPA-owned generation fleet.

The primary responsibilities of the PLO include, but are not limited to:

- Be aware of generation contracts that are currently held by PREPA.
- Activate mutual aid agreements and contracts with PREPA when needed.
- Coordinate with the Mutual Aid Unit Leader as needed.
- Ensure an open communication channel between PREPA and LUMA during an incident.
- Build and maintain relationships with PREPA stakeholders during blue sky days.
- Conduct routine maintenance of PREPA contact lists.
- Ensure disaster relief applications are submitted to the Federal Emergency Management Agency (FEMA) through PREPA.
- Ensure unity of messaging between LUMA and PREPA.

7.3 Mutual Aid Assistance

Restoring power after a major outage event is a complex operation that must be completed quickly and safely. An expedient restoration requires significant logistical expertise, along with skilled line workers and specialized equipment. Electric utilities affected by significant outages frequently call on other utilities, pursuant to mutual aid assistance agreements, for assistance to help expedite restoration. To some extent, electric utility mutual aid is limited to those partners who are present in Puerto Rico. Mutual aid from the mainland will be delayed when requested due to a major weather event that has strained transportation resources and/or facilities. LUMA is planning for limited assistance in these instances.

Mutual aid may be in the form of personnel, supplies, and/or equipment, and may be required to mitigate, repair, or restore the system to normal operations. Mutual aid from the American Public Power Association (APPA) is requested by PREPA. Mutual aid from the Edison Electric Institute (EEI) is requested by LUMA by calling the President of EEI. LUMA maintains a mutual aid roster of electric utilities which includes the names, addresses, and telephone numbers of personnel to contact at each company.

Requests for mutual aid are coordinated through the LSC and the IC. The mutual assistance resources obtained are then allocated between LUMA's East Division and West Division based on the incident needs. The resources allocated to LUMA may be pre-staged, taking into consideration the forecasted weather impacts and any pre-determined minimum staffing requirements.

The Operations Section Chief reviews the system status and, after conferring with the IC, re-allocates resources as necessary. The re-allocation of resources is based upon the damage assessments, the extent and type of damage, the number of jobs, the number of downed wires, the number of customers out of service, and the type of available resources (i.e., LUMA teams versus small groups of contractor crews), the predicted estimated restoration times, and the difficulty traveling within the service area.

A Mutual Aid Unit within the Logistics Section may be activated when the IC and General Staff deem it appropriate to request mutual assistance from other utilities for major outage events in accordance with the LUMA Major Outage Metrics, found in Appendix A of Annex A. This is typically required for Type 1 Catastrophic Emergency incidents but may be used during other event types as well. The OSC, in consultation with the IC and PSC, determine the number and type of mutual assistance crews and equipment required. The IC or designee notifies the LUMA CMC when mutual assistance crews are required.

8 Direction, Control, and Coordination

8.1 General

LUMA has established the Emergency Response Organization (ERO) for the successful management of impacts to the T&D System and major electrical outages caused by storms and other natural disasters, major equipment failure, and/or other emergencies that would have a direct effect on its customers. Annex A includes procedures that are adhered to throughout the organization whenever a failure of electrical service occurs that is deemed to be an “Emergency Event”.

Whenever possible, emergency response procedures parallel normal operational procedures to minimize the need for specialized training or work practices wherever possible. This ERP provides the framework for the systematic response of resources when emergencies arise. Annex A defines a set of processes and protocols for determining the appropriate level of response during major emergencies for:

- Restoration of electric service
- Emergency response progress notification of applicable government agencies, customers, public, and employees
- Response to official requests for specific incidents, events, or actions

Note: LUMA consistently emphasizes public and employee safety as a top priority during any response.

During an ERP activation, policy guidance is provided specifically by the CMC which consists of LUMA senior executive leadership. Resource support and coordination are provided by the LEOC down to the Regional Operations Command Centers (ROCCs). During normal operations, the LUMA Crisis Management Department supports emergency preparedness through the development of safety standards and benchmarking, and the delivery of training and exercises. Additionally, emergency preparedness includes the acquisition and maintenance of response assets such as a mobile command center, office trailers, and communications equipment.

8.2 Incident Command System Structure and Coordination

The ERP aligns with the principles of the National Incident Management System (NIMS) and employs the Incident Command System (ICS) organizational structure, including the role of the IC. This ICS construct is scalable and provides the flexibility to activate only those pieces of the organization required to respond to the incident. Within the ERO, there is an established chain of command that identifies a line of a supervisory authority and formal reporting relationships within the structure of the organization.

This chain of command is used to communicate direction and maintain a reasonable span of control within LUMA's response to an emergency. Additionally, Command and General Staff are responsible for implementing the strategic response based on strategic objectives during an emergency including, but not be limited to:

- Plan the response to the emergency and oversee its implementation.
- Implement emergency procedures.
- Communicate strategic objectives.
- Provide support to the tactical teams.

9 Information Collection, Analysis, and Dissemination

Both internal and external stakeholders require timely and accurate information as an essential tool. Every employee engaged in an emergency event has an obligation to provide information by communicating frequent updates to supervisors, maintaining accurate data in systems, and following up on information requests from internal and external stakeholders.

Operational information and situational intelligence are management functions that focus on the following three primary event areas: situation status, resource status, and anticipated Event Classification Type.

Internal and external stakeholder audiences include:

- Government of Puerto Rico and local government officials
- Customers
- General public
- Media outlets
- CMC
- LEOC and ROCC staff
- Senior LUMA officials, directors, and managers
- LUMA Employees

Depending upon the nature of the emergency event, essential elements of information may include:

- Weather predictions
- Severity of impact
- Area of impact
- Damage Assessment
- Electric transmission and distribution system operational status
- Impact to critical infrastructure
- Outages related to critical community lifelines
- Outages and jobs in Outage Management System
- Operational objectives
- Resource status (e.g., Requested, Acquired, Received (Onsite), Working, Released)

To support emergency event planning and management, tactical operations, coordination effort, and other functions, information is disseminated using a variety of methods, including but not limited to:

- Presentations and briefings during operational period briefings
- Incident Action Plan (IAP) planning meetings
- IAPs
- Situation Reports (SitReps)
- Reports from the Outage Management System (OMS)

10 Communications

The Communications and Liaison functions provide a variety of critical information to LUMA customers and government officials using a set of diverse communications resources, procedures, and interactive tools in advance of and immediately following an emergency event. The information varies from pre-event alert notifications and personal protective-action recommendations to post-event updates on projected outage impacts and restoration activities.

10.1 Joint Information Center

A Joint Information Center (JIC) is either a physical or “virtual” operation where public information staff representing all agencies and organizations involved in incident management activities coordinate and disseminate official, timely, accurate, easy to understand, and consistent information to the public. NIMS includes procedures on the responsibilities and operations of a JIC. The JIC includes PIOs from all agencies and organizations participating in incident management operations to ensure multi-agency and multi-jurisdiction coordination of all messages provided to the public.

10.1.1 Locations

Based on geographical location and Event Classification Type, a JIC may be organized and/or participated in by LUMA.

10.2 Communications with Customers

10.2.1 Notifications

During an incident, communication with the community becomes especially critical. Emergency communications may include alerts, warnings, and information not only from internal operations but external resources as well. These may include information about evacuation, curfews, and other protective measures, as well as response status, available assistance, and other matters that impact LUMA's response and recovery in accordance with the LUMA Major Outage Metrics, found in Appendix A of Annex A.

Well-conceived and effectively delivered emergency messages can help ensure public safety, protect property, facilitate response efforts, elicit cooperation, and instill public confidence.

LUMA communicates information through a variety of methods including, but not limited to:

- LUMA's website and Customer Outage Map
- News media
- Social messaging, including the use of Twitter, Facebook, and WhatsApp, among others

10.2.2 Lifeline Residential Service Customers

Lifeline Residential Service (LRS) Customers may include the elderly and customers with a disability or medical condition that necessitates electric utility service. Customers who provide documentation certifying their need for electric utility service are added to the LRS customer database. To stay on the list, LRS customers have to provide this documentation annually.

Prior to the occurrence of an emergency event, the LUMA Customer Experience Team activates the automated outbound telephone calls to LRS Customers. The telephone messages are customized and contain event information and LUMA preparation actions. This information addresses potential power outages and provides recommended protective actions to seek assistance from local public safety officials and human service agencies, as necessary.

Information is also provided to the news media for dissemination to the public regarding pre-event preparedness and post-event restoration activities. This information is developed by the PIO and approved by the IC prior to dissemination through multiple communication platforms such as telephone, email, fax, and social media.

10.2.3 Real-time Information

The Digital Communications representative(s) review and update LUMA's website to ensure that public service announcements (PSAs) are posted on the website, providing hourly real-time information to customers in accordance with the LUMA Major Outage Metrics, found in Appendix A of Annex A. The Outage Map displays outage information. Outage information is provided by region or town to include customers served and customers impacted.

10.3 Communications with Government Officials

10.3.1 Notifications

During an emergency event, through its activated liaisons, LUMA provides reports to municipal emergency managers or their designees that contain detailed information related to emergency conditions and restoration performance for each affected municipality. Reporting requirements for communicating to municipal emergency managers or their designees through the distribution of Pre-Event Stage Reports and Restoration Stage Reports (RSRs) are detailed in Section 10.1..

During emergency events, the PREMB, based in the PREMB Emergency Operations Centers (EOCs), directs, and supports emergency preparedness and response activities across the Government of Puerto Rico.

Representatives of PREPA and other agencies may also be activated in the PREMB EOC during incident response. The activation of the LEOC may coincide with the PREMB EOC, and the LUMA PREMB Liaison may be requested in their EOC. The role of the PREMB Liaison is to facilitate formal and informal two-way communication between LUMA and PREMB.

10.3.2 LUMA Regional Interagency Coordinators

When PREMB REOCs are activated, the LUMA IC shall direct the LNO to activate the LUMA Regional Interagency Coordinators (LRIACs). The primary role of an LRIAC is to be the LUMA point of contact in the PREMB REOC to communicate regional emergency-related priorities to the LEOC. The LRIACs also assist the PREMB REOC in determining if regional T&D System emergencies or outages have been reported to the LUMA Contact Center and/or LEOC. The LRIACs may be supported by a LUMA Regional Key Account Representative that has established blue skies relationships with municipal mayors.

When a T&D System emergency rises to a widespread level of outages (island-wide or near island-wide) the LEOC IC may request the activation of LUMA Customer Experience personnel that can provide support to the Municipal EOCs. The LUMA Customer Experience personnel supporting the Municipal EOCs communicates with the LEOC through the LRIAC at the PREMB REOC. The Customer Experience personnel are activated to support municipalities affected by emergency outage events to aid in prioritizing the restoration of the T&D system.

10.3.3 Meetings with Government of Puerto Rico Officials

Throughout the year LUMA meets with Government of Puerto Rico officials, federal partners, and other stakeholders. Documentation of the exercises, workshops, and meetings, such as presentations, attendance lists, meeting minutes and action items, and statuses of identified action items are submitted.

10.3.4 Meetings with Municipal Officials

During an emergency event, through the activated LRIACs, LUMA provides updates to municipal emergency managers or their designees that contain detailed information related to emergency conditions and restoration performance for each affected municipality. These updates may be in the form of a conference call or notification report in accordance with the LUMA Major Outage Metrics, found in Appendix A of Annex A.

10.4 Operational Communications

10.4.1 Interoperability

Communications interoperability allows LUMA staff in the LEOC and the ROCCs to communicate within and across LUMA via voice, data, or video in real-time, when needed, and when authorized. Interoperability planning requires accounting for event response contingencies and challenges. LUMA incorporates interoperability plans to include standard operating procedures (SOPs), technology, training and exercises, and their utilization during emergency response and restoration operations. Communications and information systems are also designed to be flexible, reliable, and scalable.

10.4.2 Incident Communications Plan

Contained within the IAP is the Incident Communications Plan. The Incident Communications Plan is updated as needed and includes incident-specific contact information for the Command and General Staff positions and for the Division Commanders. Contact information may include telephone (desk & cell numbers) and satellite phone (if applicable). The Incident Communications Plan is distributed to Command, General Staff, Division Directors, and Regional Interagency Coordinators as part of the IAP.

10.4.3 Communications Information Flow Chart

During the development of the Information Flow Chart, please refer to page 34, Section 6, Concept of Operations. Additionally, refer to Section 7, Organization and Assignment of Responsibilities.

10.4.4 Communications Systems

Primary communications systems utilized during emergencies include FirstNet First Responder Cellular networks, wired phone exchange systems, Voice Over IP systems (ethernet) and VHF radio systems where deployed.

Backup systems are available to be deployed in case of issues with primary communication systems. These include rapid deployment of mobile cellular access points with satellite uplinks, portable satellite phones, and on request, a flying cellular FirstNet hotspot to cover areas where there is no longer coverage. LUMA additionally works with municipalities and liaison agencies for consolidated communications when beneficial based on the circumstances of the emergency.

11 Administration and Finance

11.1 Reporting

There are several reports and documents generated to facilitate and record the response to an emergency. These are broken out by those required by regulators and those utilized by LUMA during an emergency response. Each of the reports included here is tied back to the process in the ERP from which they are generated or for which they are used. The processes and activities in this chapter are initiated once the emergency event has been classified and the Emergency Response Organization (ERO) has been activated. Table 10 details the types of reports and documentation that are developed, and the key positions needed to develop the associated reports.

Reports and Documentation		
Internal Reports and Documentation	Regulatory Driven Reports and Documentation	After-Action Report
Key Positions	Key Positions	Key Positions
Safety Officer Planning and Intelligence Section Chief Operations Section Chief	Emergency Management Officer Planning & Intelligence Section Chief Regulatory Liaison Officer Reporting Unit Leader	Emergency Management Officer Command Staff General Staff Section Chiefs

Table 10: Reports and Documentation

11.1.1 Internal Reports and Documentation

Incident Action Plan

The incident action planning process is used for all incidents involving the activation of the LEOC. The “Planning P” is a tool used in applying the principle of Incident Action Planning. An Incident Action Plan (IAP) provides a coherent means of communicating the overall incident objectives in the context of both operational and support activities.

A formal incident specific-IAP may be necessary to aid the First Responders and to distribute current information quickly across both the organization and to any external agencies aiding in the incident response effort. An IAP provides clear direction and includes a comprehensive listing of the tactics, resources, and support needed to accomplish the objectives.

Damage Assessment Report

A Damage Assessment Report is submitted once assessments have been completed in the affected areas. The Damage Assessment Unit within the LEOC is responsible for drafting and submitting the damage assessment report to the Operations Section Chief (OSC).

Safety Incident Report

The Safety Officer (SOFR) is required to submit a Safety Incident Report upon learning of any safety incident throughout the response and restoration efforts. Safety reports are to be submitted to the Incident Commander (IC) or his/her designee and to the Documentation Unit.

11.1.2 Regulatory Driven Reports and Documentation

Appendix D contains a sample for all reports referenced in this section.

Under the T&D OMA, LUMA is required to notify the Puerto Rico Energy Bureau (PREB) and Puerto Rico Public-Private Partnerships Authority (P3A) of an Emergency (refer to Section 15.2), to provide weekly notifications throughout an Emergency, and provide notifications when an Emergency has ended. In the event of a Major Outage Event, LUMA Performance Metrics require LUMA to notify the PREB and P3A daily instead of weekly. All reporting below meets the above-mentioned requirements of an Emergency and a Major Outage Event.

Pre-Event Reports

The Planning and Intelligence Section is responsible for documentation and reports related to this section. Reports are submitted to the PREB, P3A, PREMB, appropriate regional representatives, and municipal emergency managers or their designees upon request that contains detailed information related to emergency conditions and restoration performance for each affected city and town in accordance with the Major Outage Metrics found in Appendix A of Annex A.

Pre-Event Stage Notifications (for Events anticipated to reach Type 1, 2, 3 or 4)

During the Pre-Event Stage, LUMA shall notify Lifeline Residential Service (LRS) Customers and identify Critical Facility contacts in areas that are anticipated to be significantly affected via an automated call out of the anticipated event.

Pre-Event Stage Reports (for Events anticipated to reach Type 1, 2, or 3)

During the Pre-Event Stage, reports shall be submitted at minimum (1) once daily or more frequently if deemed necessary during an event or upon request; and (2) when the IC changes the event type. All Pre-Event Reports shall be submitted to the PREB, P3A, PREMB, and the LUMA Crisis Management Committee (CMC).

Depending on the nature of the event and information available at the time of reporting, Pre-Event Reports may contain, but are not limited to, the following information:

- Date and time of the report.
- Estimated percentage of customer outages.
- Estimated number and type of resources required (including the number of crews and full-time equivalents).
- Number of internal resources secured (by type and including the number of crews and full-time equivalents).
- Number of external resources secured (by type and including the number of crews and fulltime equivalents).
- Estimated duration of restoration.
- Weather forecasting and monitoring information
- Planned storm conference calls (indicating date and time)
- Pre-event communications with the public, municipal contacts, and elected officials (describing communication methods)
- Pre-event notifications with PREB, P3A, PREMB, critical facilities (describing communication methods), and those with power-dependent medical needs
- Expected event classification type (describe expected severity), including all facts considered in the determination. In addition, describe any changes to event classification type, if applicable, and the facts considered in the determination
- Resource readiness (indicating actions taken to ensure availability of crews and material resources indicating type and quantity of available crews)
- Likelihood of the LEOC being activated (indicating date and time activated or predicted to be activated)
- Challenges anticipated or encountered in preparation for the anticipated emergency.
- Any other pertinent information.

Restoration Stage Reports

During the Restoration Stage (for Type 1, 2, or 3 Events), reports shall be submitted to the PREB, P3A, PREMB, and the LUMA CMC that contain detailed information related to emergency conditions and restoration performance for each affected city and town.

The Planning and Intelligence Section Chief (PSC), when activated, is responsible for the documentation and reports described in this section. Reports are typically assembled by the LEOC Reporting Unit with support from the LEOC Situation Unit Staff based upon communication with the Command Staff, OSC, and the PSC and are provided to the LEOC CMC, PREB, P3A, and PREMB.

LUMA provides updates on the estimated time of restoration (ETR) at the completion of the damage assessment or after the first 24 hours following the start of the damage assessment, whichever occurs first. ETRs are reported in one or more of the following ways:

- LUMA Restoration Stage Reports.
- Via telephone by the Customer Call Center Representative.
- LUMA's outage central website.
- Appropriate media outreach.
- Established LUMA Call Center (when activated).
- Municipal Liaisons (Type 1 and 2 Events).

Depending on the complexity and severity of the emergency event, the frequency of Restoration Stage Reports may fluctuate but are submitted to PREB, P3A, and PREMB, at a minimum of once per day until restoration is complete or more frequently if deemed necessary during an event. Restoration Reports include information regarding customer outages, ETRs, and restoration resources.

The final Restoration Report must be submitted to the PREB and P3A, as per the required Event End Notification under the T&D OMA, outlining when an event type has been downgraded to a level 4 and remaining activities will be resolved during normal operations.

Reports to Municipal Emergency Management

During an emergency event, LUMA shall provide reports to municipal emergency managers or their designees that contain detailed information related to emergency conditions and restoration performance for each affected city and town. Reports may be carried out in any of the following ways:

- Scheduled conference calls with municipal officials, including emergency managers.
- Community Liaison communications (telephonic, electronic and/or face-to-face) with municipal officials, including emergency managers.
- Provision of emergency conditions and restoration information, including but not limited to outage and restoration information, priority down wire locations, and critical facilities impacted by the emergency event.

Internal Reports

- For emergencies classified as Type 1 or 2 events, a Final Event Report is completed and submitted to the LUMA CMC within 30 days of the completion of restoration activities. On certain occasions it may be requested to submit a Final Event Report for Type 3 events. The LEOC PSC coordinates the drafting and filing of the Final Event Report.

11.1.3 After-Action Review (Hot Wash)

For Type 1, 2, and 3 events, LUMA Crisis Management organizes a meeting to review the details of the emergency response. The purpose of this after-action review, or hot wash, is to identify needed improvements to the ERP, procedures, facilities, or resources. To ensure a cycle of continuous improvement, individuals with responsibilities within the ERO are requested to fully participate in the hot wash evaluating performance and identifying functions and operations within the ERP that may need to be revised.

Additionally, the established emergency response process should be evaluated. During the emergency, participants are requested to make note of opportunities to improve the process and/or participants' performance in implementing the process. Participants are encouraged to record observations and recommendations as they occur. Following the conclusion of the emergency, participants are requested to submit additional observations electronically to Crisis Management.

11.2 Records

The IC and the LEOC shall maintain accurate logs recording significant operational activities, the commitment of resources, and other information relating to emergency response and recovery operations. Expenses incurred in carrying out emergency response operations may be recoverable. Hence, all service elements maintain records of personnel and equipment used and supplies consumed during large-scale emergency operations.

11.3 Preservation of Records

Vital records should be protected from the effects of a disaster to the maximum extent feasible. Should records be damaged during an emergency, professional assistance in preserving and restoring those records should be obtained as soon as possible.

11.4 Finance

LUMA's Disaster Recovery Federal Funds Procurement Guide is intended to provide a clear picture of LUMA's Federal Funds Procurement policies and procedures and address the way LUMA must conduct the selection, award, and administration of contracts funded by Federal awards.

The overall objectives of the procurement policies are to minimize the risk of improper procurement and contracting; allow for free and open competition; and provide procurement policies and procedures easily understood and implemented in conjunction with LUMA's Non-Federal Funds Procurement Policies and Procedures.

However, in the case of public exigency or emergency a competitive solicitation may not be required if it will result in a delay in securing required resources or services. Exigency is a situation that requires or demands immediate aid or action. An emergency is an unexpected and unusually dangerous situation that calls for immediate action or an urgent need for assistance or relief. In these cases, LUMA may need to perform the procurement in a non-competitive manner.

Use of the public exigency or emergency exception is only permissible during the actual exigent or emergency circumstances. LUMA is expected to transition to a more appropriate method of contracting using full and open competition once the exigent emergency ends.

11.4.1 Crisis Procurements

Upon activating LUMA Crisis Management (CM) protocols, the following steps are to be taken. For clarity, unless and until CM has been activated, standard procurement processes apply.

1. CM activated and communicated organization-wide.
2. CM project and tasks established by Finance.
3. Establish a general ledger account to capture costs.
4. Notify the organization of the newly created account to capture costs.
5. The Director, Procurement & Contracts is given Requisition Approval for the entire organization, notwithstanding existing Limits of Authority. The department's Business Continuity plan shall provide for delegation of this authority such that 24-hour coverage is maintained.
6. Procure leveraging Federal Fund rules during the emergency period which is typically 72 hours.
7. Ensure underlying support requirements are communicated to vendors.
8. Requisitioning in Oracle or Asset Suite to be performed internally by Procurement & Contracts:
 - a. Designate Procurement & Contracts staff to create requisitions based on email requests coding to the emergency project and task. The Director to approve all Requisitions with attached emails as back up.

- b. Designate separate Procurement & Contracts staff to create Purchase Orders (PO) against the emergency Requisitions. POs to follow standard PO Approvals.
 - c. As appropriate, Finance team members to be deployed to field sites to monitor and track supply additions and issuances.
9. Reporting on CM POs to be prepared for CM leadership, as required.
10. Upon deactivation of the CM, Procurement & Contracts to ensure appropriate single-sourced justifications are in place.

12 Advanced Planning, Training, and Exercises

12.1 Overview

A successful response to emergency events requires a Company-wide commitment to preparedness that is integrated into LUMA's daily operations, not just during emergency events. LUMA's Emergency Management program is designed to increase disaster preparedness and response capabilities, resulting in the safe and reasonably efficient restoration of service during an emergency event. The program is based on a continuous cycle of plan development and exercising the plans and procedures to ensure they are effective, as shown in Figure 10. This continuous emergency preparedness cycle lends itself to continuous improvement.

Emergency preparedness activities can include planning, training, and participating in exercises; attending meetings with public safety officials, the Crisis Management Department staff, and PREMB personnel; and maintaining updated contact information of personnel and organizations that may assist in LUMA's restoration efforts.

Every employee is expected to participate in preparedness activities throughout the year including planning, training, and exercise activities related to their assigned ERP role. Creating a culture of preparedness results in operational excellence during activations of the ERP.



Figure 10: LUMA's Preparedness Cycle

12.2 Planning

This ERP is reviewed at least annually and revised as necessary. All Command and General Staff, departments, divisions, offices, and subject matter/technical experts with responsibilities in this ERP are required to review its contents and update the information to keep the ERP relevant.

The ERP is a living document and revisions deemed necessary are a result of lessons learned during ERP activation(s) based upon the After-Action Report (AAR) and Improvement Plan (IP), training and exercises, government agencies requests or from best practices and/ or industry standards adopted.

12.3 Training

The LUMA Crisis Management Department maintains the ERP-related training database and coordinates ERP-role related training. Training, drills, and exercises are designed and conducted to develop and improve the knowledge and skills of personnel assigned to emergency response activities, and to support the safe and reasonably prompt completion of all required actions during ERP activations.

A large percentage of LUMA employees' ERP roles and responsibilities are either the same or very similar to the duties they perform under their normal "Blue Sky" duties. LUMA provides position-specific training for personnel whose response and/or restoration responsibilities differ from tasks they normally perform on a regular basis. In addition to skill-based training related directly to their ERP assignment, the training includes ICS protocols for Command staff and General staff in the LEOC and ROCCs. ERP-related training reports are maintained by Crisis Management, including the type of training and training dates for each participating employee.

Skill and role-based training include hands-on training in the associated computer-based programs utilized in their ERP assignment. Other skill-based training includes but is not limited to the emergency positions of Damage Assessment, Debris Removal, Wire Guard, Low Voltage Service Crew, and Customer Contact Center staff.

The Section Chiefs and Officers ensure that annual meetings are held by the Branch Directors, Group Managers or Unit Leaders for employees assigned to their functional area and whose primary emergency assignment differs from their blue-sky position. The meetings review the processes related to employees' primary emergency assignment, employees' completion of related training, tasks and tools associated with employees' primary emergency assignment, and confirm that employees have been issued Personal Protective Equipment (PPE) required to complete their primary emergency assignment, and review of the obligation of employees to report to work when activated and that employees are aware of notification methods. Training on the ERP is conducted throughout the year and completed prior to June 1st.

12.4 Exercises

The LUMA exercise program follows guidelines from the Homeland Security Exercise Evaluation Program (HSEEP) developed by FEMA. The HSEEP methodology is defined and implemented using seven exercise types, broken into the categories of discussion-based exercises and operations-based exercises.

Discussion-based exercises (including seminars, workshops, and tabletop exercises) are commonly used to familiarize exercise players with current plans, policies, agreements, and procedures, and to develop new plans, policies, etc. Operations-based exercises (including drills and functional exercises) are used to validate and/ or evaluate plans, policies, procedures, and training; to clarify roles and responsibilities, and to identify resource gaps. Figure 11, on the following page, displays all these different exercises.

LUMA employs a variety of these exercise types based on the exercise goals and objectives. Discussion and operations-based exercises are conducted each year based on a schedule developed and updated by the LUMA Crisis Management Department. One exercise that takes place every year simulates communication with outside agencies.

The goal of conducting exercises is to enhance training, improve familiarization, evaluate and/or validate plans, policies, and procedures, increase capabilities, and practice skills in a no-fault, risk-free environment.

Exercises are specifically used for:

- Improving individual and overall organizational performance
- Improving coordination and communication
- Testing and validating policies, plans, procedures, training, and equipment
- Identifying gaps in resources (both personnel and equipment)
- Exercising the ICS principles and protocols
- Identifying opportunities for improvement

Exercises are utilized to identify opportunities for improvement in a variety of areas, including staffing, planning, training, and equipment/ resources. A Hot Wash is conducted, and an AAR/IP is developed after major exercises and real-world incidents, identifying, and prioritizing the opportunities for improvement and facilitating further development of action steps. When completed, these IP items are incorporated into the ERP and related response tools.

LUMA schedules annual exercises for employees who have assigned responsibilities during an emergency event. ERP Type 2 and 1 emergency events, however, provide LUMA with similar opportunities to evaluate readiness, and are followed by conducting an AAR and the development of an IP. These real-world events provide valuable learning opportunities, and the lessons learned from such events are incorporated into the ERP and used to identify/prioritize future planning, training, and exercise activity.

In addition to ERP-specific exercises, LUMA conducts discussion-based exercises to accomplish a variety of objectives. Table-top exercises are conducted to validate LUMA's response to an emergency event that could occur simultaneously with a loss of business continuity, a national emergency, or a pandemic incident.

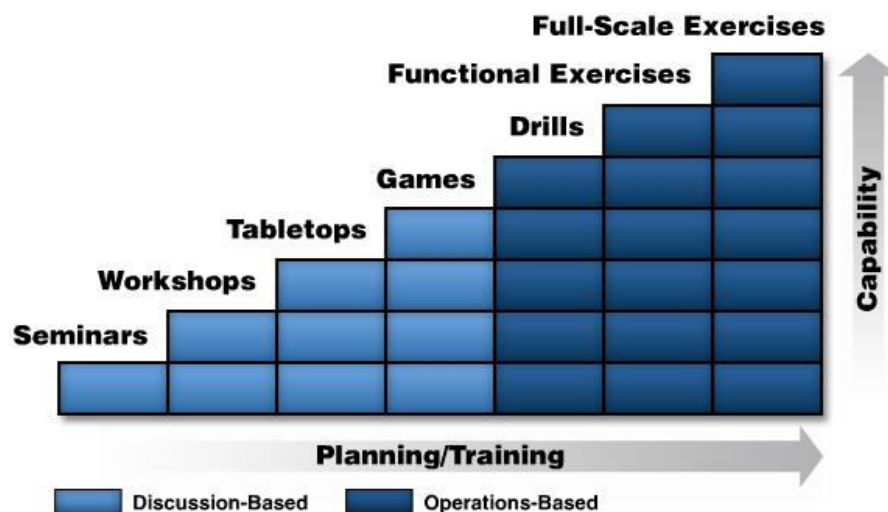


Figure 11: The different types of exercises

12.5 Employee and Family Emergency Preparedness

To help employees and their families prepare for a prolonged outage, LUMA includes personal preparedness information and recommendations in the daily electronic newsletter, LUMA Corporate Communications, sent to all employees.

The information and recommendations can be based on communications released by Ready.gov or RedCross.org which provide preparedness actions and additional information that benefits them and their families.

Strategies that are utilized include, but are not limited to:

- Provide employees with resources to create a family emergency plan.
- Annually share information about Ready.gov's National Preparedness Month (September) along with their weekly activities to enhance preparedness at home.
- Provide hurricane-specific preparedness and response information.
- Provide employees with resources for reducing home hazards.
- Provide employees with resources on how to assemble a Disaster Kit.
- Provide employees access to emergency alerts.

13 Plan Development and Maintenance

The ERP is a living document. As gaps become apparent, regulatory requirements change, problems emerge, or situations/environments change, this ERP is modified to remain current and useful. Each year, all LUMA departments and functions review their procedures, guidelines, checklists, and instructions relating to emergency response and revise them as necessary. This Base Plan and Annexes are to be submitted to the Governor, PREB, and both Houses of the Legislative Assembly no later than May 31 on an annual basis.

Each functional area of the ERP is responsible to review and update its database of employee and stakeholder contacts. Elements of the review include:

- Community Lifeline organizations and critical facilities.
- All utility personnel assigned to emergency response.
- Mutual assistance companies and contractors.
- Lifeline Residential Service (LRS) Customers and other special needs customers.
- Human Service agencies.
- Print and broadcast media.
- Operators and managers of lodging facilities and restaurants.
- Government of Puerto Rico and local elected officials.
- Law enforcement and other emergency response personnel.
- Pertinent material and supply vendors.
- Telephone and other third-party utility and Joint Use contacts.

Any changes to this database are communicated to the LUMA Crisis Management Department for inclusion in the next update of the ERP. In the event significant changes are made during the year, the Crisis Management Department provides a timely briefing to employees.

The Crisis Management Department reviews past events ensuring the criteria and assumptions used as the basis for the ERP are applicable. In the case that other LUMA departments and functions need to make changes to the ERP, these proposed changes can be submitted to the Crisis Management Department for approval before being incorporated into the official version of the ERP.

13.1 Revisions

A revision may require the development and distribution of a new version of this ERP depending on the volume edited or it is required to update to new distribution software. The new version of the ERP should receive a new date and requires new approvals by LUMA officials.

13.2 Formal Plan Changes

Making formal changes to this LUMA ERP involves revising parts of the document by making specific changes to a limited number of pages. Changes are then sent to each agency or organization on the distribution list, along with a cover memorandum that details which pages are to be removed and which replacement pages need to be inserted in the document.

The person who receives the change(s) is responsible for updating those changes within their copy of the ERP and recording those changes on the Record of Changes page located at the front of the document to indicate the change has been incorporated.

The original document date does not need to change and new signatures on the document do not need to be collected for formal ERP changes but may be useful for tracking revisions.

14 Authorities and References

14.1 Authorities

- Homeland Security Act of 2002
- The National Security Strategy
- National Response Framework, as amended
- National Disaster Recovery Framework, as amended
- The Single Audit Act of 1984
- Robert T. Stafford Disaster Relief and Emergency Assistance Act, Public Law 93-288, as amended
- 42 U.S. Code § 5170. (2013, January 29). Procedure for Declaration.
- Housing and Economic Recovery Act of 2008
- Emergency Management and Assistance, Code of Federal Regulations, (CFR) 44
- Price-Anderson Amendments Act of 1988, Public Law 100-408, as amended
- Emergency Management Assistance Compact, Public Law 104-321
- National Incident Management System (NIMS), October 2017
- Homeland Security Presidential Directive (HSPD) 3: Homeland Security Advisory System, March 2002
- Homeland Security Presidential Directive (HSPD) 5: Management of Domestic Incidents. February 2003
- Presidential Policy Directive (PPD) 21: Critical Infrastructure Security and Resilience, February 2013
- Presidential Policy Directive (PPD) 8: National Preparedness, March 2011
- Executive Order 13347, Federal Register, Individuals with Disabilities in Emergency Preparedness
- 13 CFR Part 123, Small Business Administration Disaster Loan Program
- 2 CFR Part 200, Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards
- 44 CFR Part 206, Federal Disaster Assistance for Disasters Declared on or after November 23, 1988
- Americans with Disabilities Act (ADA) of 1990
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15 Explanation of Terms

15.1 Acronyms

AAR	After Action Report
AOUL	Air Operations Unit Leader
APPA	American Public Power Association
AST	Section Assistant
BES	Bulk Electric System
CAD	Computer Aided Dispatch
CEO	Chief Executive Officer
CHK	Check-In Staff
CISA	Cybersecurity and Infrastructure Security Agency
CLAL	Claims Unit Leader
COMB	Communications Unit Leader
COML	Communications Unit Leader
CPG	Comprehensive Preparedness Guide
CRS	Community Relations Specialist
CSL	Corporate Security Unit Leader
CUSE	Customer Experience Specialist
D/FSC	Deputy Finance and Administration Section Chief
D/IC	Deputy Incident Commander
D/LSC	Deputy Logistics Section Chief
D/OSC	Deputy Operations Section Chief
D/PSC	Deputy Planning and Intelligence Section Chief
DAL	Damage Assessment Unit Leader
DIGC	Digital Communications Specialist
DOCL	Documentation Unit Leader
DVML	Donations/Volunteer Management Unit Leader
EAS	Emergency Alert System
EBD	East Division Branch Director
ECOM	Employee Communications Specialist
EEI	Edison Electric Institute
EMO	Emergency Management Officer
EMS	Emergency Medical Services
EOC	Emergency Operations Center
EPA	Environmental Protection Agency
ERO	Emergency Response Organization
ERP	Emergency Response Plan
ESF	Emergency Support Function
ETR	Estimated Time of Restoration
ETRS	ETR Specialist

FACL	Facilities Unit Leader
FEMA	Federal Emergency Management Agency
FLUL	Food/Lodging Unit Leader
FSC	Finance Section Chief
GIS	Geographic Information System/ Unit Leader
GLO	LUMA Generation Liaison Officer
HSEEP	Homeland Security Exercise Evaluation Program
HSEQ	Health Safety Environment & Quality
IAP	Incident Action Plan
IC	Incident Commander
ICS	Incident Command System
IPAWS	Integrated Public Alert & Warning System
IT	Information Technology
JIC	Joint Information Center
LEOC	LUMA Emergency Operations Center
LEOCM	LUMA Emergency Operations Center Manager
LNO	Liaison Officer
LRIAC	LUMA Regional Interagency Coordinator
LRS	Lifeline Residential Service (Customers)
LSC	Logistics Section Chief
MAA	Mutual Aid Agreement
MAA	Mutual Aid Unit Leader
MEDO	Medical Officer
MMS	Materials Management System
MOE	Major Outage Event (Metrics)
MOES	MOE Metrics Specialist
NAWAS	National Warning System
NIMS	National Incident Management System
NOAA	National Oceanic and Atmospheric Administration
NRF	National Response Framework
NWR	NOAA Weather Radio
OMS	Outage Management System
OSC	Operations Section Chief
OT	Operational Technology
PIO	Public Information Officer
PLNO	LUMA PREMB Liaison Officer
P3LNO	LUMA PREB and P3A Liaison Officer
POC	Person of Contact
PR	Public Relations
PR	Puerto Rico
PRASA	Puerto Rico Aqueduct and Sewer Authority

PREB	Puerto Rico Energy Bureau
PREMB	Puerto Rico Emergency Management Bureau
PREPA	Puerto Rico Electric Power Authority
PRG	Priority Restoration Group
PROC	Procurement Unit Leader
PSA	Public Service Announcement
PSC	Planning and Intelligence Section Chief
REGS	Regulatory Reporting Specialist
SCADA	Supervisory Control and Data Acquisition

15.2 Terms

After Action Report – A document intended to capture observations of an exercise/event and make recommendations for post-exercise improvements. The final AAR and Improvement Plan (IP) are printed and distributed jointly as a single AAR/IP. Refer to Hot Wash, below.

Assumptions – Operationally relevant parameters expected and used as a context, basis, or requirement for the development of response and recovery plans, processes, and procedures.

Business Continuity – A set of activities that identifies potential impacts that threaten an organization and provides a framework for building resilience with the capability for an effective response that safeguards the interests of its key stakeholders, reputation and value-creating activities.

Capability – The ability to achieve a specific outcome with an applicable combination of planning, organization, resources, and trained and exercised personnel. Emergency Management and Business Continuity capabilities are those that are needed collectively to prepare for, respond to, and recover from events with the potential of impacting the operational and business functions of LUMA.

Check-In – The process necessary to receive and begin accounting for incoming external resources to enable them to participate in emergency restoration activities safely and effectively.

Comprehensive Preparedness Guide 101 – provides FEMA Guidance on fundamental planning and developing emergency operations plans (EOPs).

Community Lifelines – critical government and business functions essential to human health and safety or economic security.

Crisis Management – the process by which an organization deals with a disruptive and unexpected event that threatens to harm the organization or its stakeholders

Critical Facilities - Critical facilities identified as Level 1, 2, or 3 facilities provide services that are critical to the health and safety of the public and are tied to at least one of the seven critical community lifelines. Examples include hospitals, fire/police stations, restoration staging areas, and communications facilities.

Critical Infrastructure – A list of customers for which the loss of electrical service would result in disruption of a critical public safety function is designated as “Critical Infrastructure”. Examples include wastewater treatment plants and transportation.

Disaster – An occurrence of a natural catastrophe, technological accident, or human-caused event that has resulted in severe property damage, deaths, and/or multiple injuries and exceeds the response capability of the local jurisdiction and requires the Government of Puerto Rico, and potentially Federal, involvement.

Emergency or Emergency Event – Any outage event, as per the T&D OMA; declared emergency or major disaster; or event, whether natural or manmade, that requires responsive action to protect life, property, and/or operational capacity where LUMA has deemed it an Emergency and/or necessary to activate the LUMA Emergency Operations Center.

Emergency Operations Center – The physical locations at which coordination of information and resources to support incident management activities occurs.

Emergency Response Organization – A structured organization with overall identified responsibilities for initial and ongoing emergency response and mitigation. Includes those in the EOCs and those in the field.

Emergency Response Plan – A comprehensive plan that provides the concept of operations for response to emergency situations and other extraordinary events consistently and effectively.

Emergency Support Functions - ESFs provide the structure for coordinating Federal interagency support for a Federal response to an incident. They are mechanisms for grouping functions most frequently used to provide Federal support to States and Federal-to-Federal support, both for declared disasters and emergencies under the Stafford Act and for non-Stafford Act incidents.

Geographical Information System – A framework that is used to map the distribution system with land base information.

Homeland Security Exercise Evaluation Program – A capabilities and performance-based exercise program that provides standardized policy, doctrine, and terminology for the design, development, conduct, and evaluation of homeland security exercises.

Hot Wash - A facilitated discussion held immediately following an exercise or event among participants that is designed to capture feedback about issues, concerns, or proposed improvements. The output from this discussion is used during the after-action meeting and ultimately in the development of the After-Action Report.

Incident Action Plan – Includes the overall incident objectives and strategies established by the Incident Commander. The Planning Section is responsible for developing and documenting the IAP.

Incident Commander – The individual appointed by LUMA's executive management to have overall responsibility for LUMA's response during an Emergency Event.

Incident Command System - Coordinated and collaborative incident management construct specifically designed and made a part of the National Incident Management System ("NIMS") under the Federal Emergency Management Agency ("FEMA").

Lifeline Residential Service Customers – Also known as medical priority customers, means those customers who have provided documentation to LUMA of their medical conditions necessitating electric service.

Municipal Liaison – Means a liaison designated by LUMA to communicate with a municipality during an Emergency Event.

Mutual Assistance Agreements – Agreements between LUMA and other utilities, both inside and outside the state, that details specifics for obtaining or lending resources, including, but not limited to, material, equipment, and trained personnel, when internal resources are not sufficient to ensure the safe and reasonably prompt restoration of service during an Emergency Event.

Outage Management System – System used to identify customer outages, assign trouble crews, and record outage event statistics.

Post-Event Stage – The period immediately following the restoration of service to all customers after an Emergency Event.

Pre-Event Stage – The period of time between when LUMA first identifies an impending Emergency Event and when the Emergency Event first causes damage to the system resulting in Service Interruptions.

Risk Analysis – The first step and process of identifying and analyzing defining characteristics and potential issues that may negatively impact organizations.

Risk Assessment – The process of identifying the risk analysis and making judgements of potential events that may impact the organization.

Supervisory Control and Data Acquisition – Electronic monitoring equipment that reports the status of distribution equipment.

Service Interruption – The loss of service to one or more customers connected to the electric distribution system.

Service Restoration Stage – Period of time between when an Emergency Event causes damage to the system (causing Service Interruptions), and the time when service is restored to all customers.

System Level ERO – Multi-regional Emergency Response Organization.

Appendix A – LUMA ICS Principles

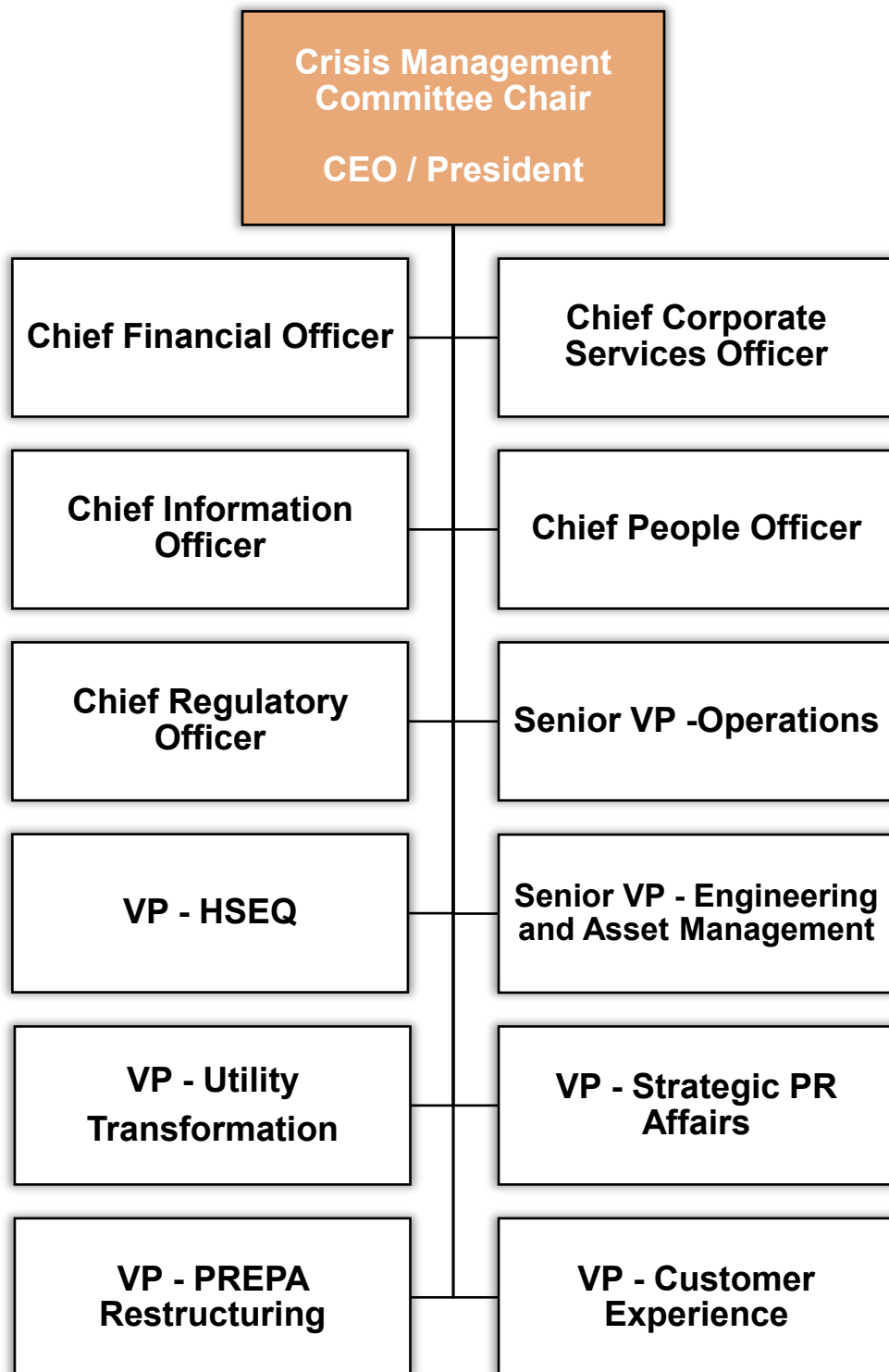
Event Classification Types

LUMA Event Classification	Characteristics
Type 5 Normal Operations	Non-Emergency Restoration Event – <ul style="list-style-type: none"> • Response and Restoration efforts last for less than 12 hours
Type 4 Non-Emergency Event	Non-Emergency Restoration Event – <ul style="list-style-type: none"> • Response and Restoration efforts last for approx. 12-24-hour period • Locally assigned crews and contractors respond to any isolated incidents
Type 3 High Alert Event	Response and Restoration efforts last for approx. 24-48 hours <ul style="list-style-type: none"> • 70k to 350k customer interruptions at peak (represents between 10-25 percent of all LUMA customers) • 10k or more outages at peak • May require activation of ICS
Type 2 Emergency Conditions Event	Response and Restoration efforts are accomplished in a 7-day period or less <ul style="list-style-type: none"> • 350k to 700k customer interruptions at peak (represents between 25-50 percent of all LUMA customers) • Causes 25k or more outages at peak • Restoration is expected to take up to 7 days
Type 1 Catastrophic Emergency	Response and Restoration efforts may require ten (10) days or more <ul style="list-style-type: none"> • 700k or more customer interruptions at peak (represents at least half of all LUMA customers) • 50k or more outages at peak • Restoration may take 10 days or longer • Will require mutual aid assistance

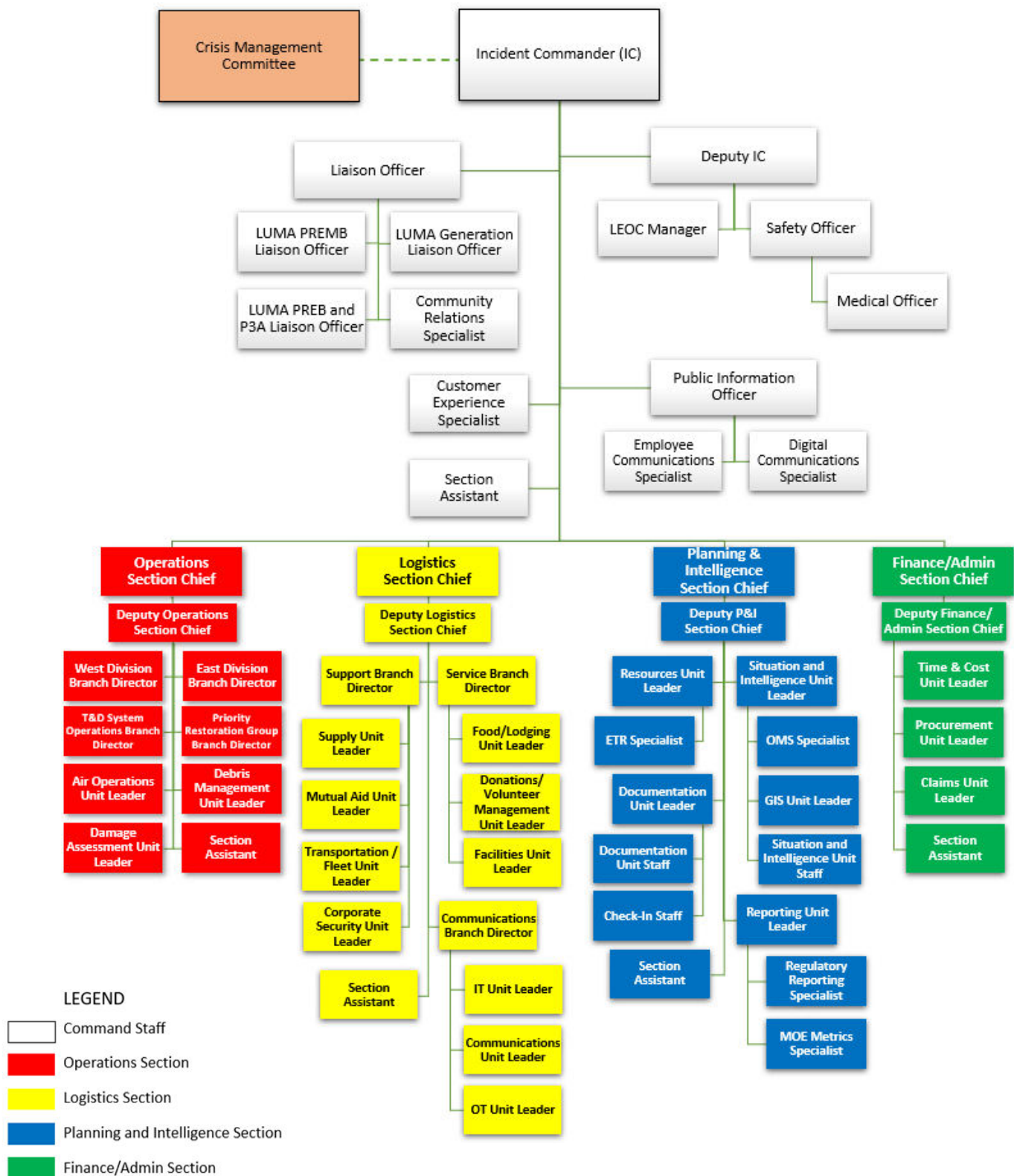
LEOC Activation Levels

LEOC Activation	Characteristics
Level 5 Normal Operations	Normal Day to Day Operations
Level 4 Heightened Alert	<ul style="list-style-type: none"> No worker injuries No or low media interest Spills and releases confined to site/lease Public/employee health & safety not threatened Pre-storm preparation activities also occur
Level 3 High Alert	<p>After an event occurs, at least 3 of the following are present:</p> <ul style="list-style-type: none"> First aid treatment required for worker(s) Local and possible regional media interest Public/employee health & safety or environment not threatened – perception of risk present Spills and releases not contained on lease or potential extend beyond site/lease Pre-storm preparation activities also occur
Level 2 Emergency Conditions	<p>After an event occurs, at least 3 of the following are present:</p> <ul style="list-style-type: none"> Multiple workers require hospitalization Regional & national media interest Spill or release not contained, extends beyond lease Public/employee health & safety or environment could be jeopardized
Level 1 Catastrophic Emergency	<p>After an event occurs, at least 3 of the following are present:</p> <ul style="list-style-type: none"> Mass Fatality Incident National & international media interest Spill or release off site / not contained Public / employee health & safety or environment jeopardized

Crisis Management Committee Structure



LEOC Command and General Staff Structure



Appendix B – Assignment of Responsibility

LUMA Crisis Management Committee

The LUMA CMC provides strategic direction and corporate policy to the LEOC IC during response. It is composed of the most senior-level executives and is chaired by the CEO. The CMC consists of the following members:

- CMC Chair
- Chief Financial Officer
- Chief Information Officer
- Chief People Officer
- Chief Corporate Services Officer
- Chief Regulatory Officer
- Senior VP – Operations
- Senior VP – Engineering and Asset Management
- VP – HSEQ
- VP – Customer Experience
- VP – Utility Transformation
- VP – PREPA Restructuring
- VP – Strategic PR Affairs

Command Staff

The Command Staff is led by the IC and includes the following positions:

- Incident Commander (IC)
- Deputy IC (D/IC)
- Emergency Management Officer (EMO)
- LEOC Manager (LEOCM)
- Safety Officer (SOFR)
- Medical Officer (MEDO)
- Public Information Officer (PIO)
- Digital Communications Specialist (DIGC)
- Employee Communications Specialist (ECOM)
- Liaison Officer (LNO)
- LUMA PREMB Liaison Officer (PLNO)
- LUMA PREB and P3A Liaison Officer (P3LNO)
- LUMA Generation Liaison Officer (GLO)
- Community Relations Specialist (CRS)
- Customer Experience Specialist (CUSE)
- Section Assistant (AST)

Incident Commander

The IC is responsible for directing and coordinating all aspects of the emergency response effort. The priorities of the IC are determined by the extent, size, duration, and complexity of the incident, as well as the availability of resources. The IC may determine that an emergency condition exists for the system or a division and invoke scaled response and recovery actions, as needed. This determination allows expeditious resource procurement and efficient allocation of existing assets.

The primary responsibilities of the IC include, but are not limited to:

- Exercise overall management of delegation, coordination, and support of the incident.
- Estimate the event type associated with the incident and the level of staffing needed in the LEOC.
- Activate the ERO and LEOC, as appropriate for the event type.
- ERP activation, as necessary.
- Utilize information and damage assessments.
- Determine the number of resources required to respond to an event including internal, external, contract, mutual aid, etc., direct efforts to obtain the required number of resources throughout the event, and allocate available resources on a system-wide basis.
- Ensure emergency communication protocols are implemented.
- Overseeing LEOC support activities. This may include routine coordination conference calls with the command and general staff chief positions, impacted Branch Directors, and municipal emergency management officials.
- Implement strategic objectives as instructed by the LEOC CMC and provide restoration response status information to senior management and the LEOC.
- Identify and mitigate adverse customer, regulatory, or other constituent sentiment and communicate resolution plans to the LEOC.
- Obtain strategic direction from the CMC and maintain an open line of communication.
- Ensure adequate and effective coordination among all functional areas involved in incident response.
- Implement the ERP demobilization process including the structured release of resources.
- Implement post-event review processes including any post-event Municipal Official outreach programs and the creation of after-action reviews, reports, and improvement plans.

Deputy Incident Commander

The IC may have a Deputy Incident Commander (D/IC), who could be an employee from LUMA or an assisting organization. Deputies must have the same qualifications as the person for whom they work, as they must be ready to take over that position at any time.

The primary responsibilities of the D/IC include, but are not limited to:

- Assist and serve as an advisor to the IC and General Staff as needed, providing information related to the internal functions of the LEOC to ensure compliance with operational emergency plans and procedures.
- Oversee the LEOC Manager, Emergency Management Officer, and the Safety Officer.
- Assist in establishing appropriate staffing and activation level for the LEOC, continuously monitoring organizational effectiveness, and ensuring any necessary modifications occur as required.
- Ensure adequate and effective coordination among all functional areas involved in incident response.

LEOC Manager

The LEOC Manager (LEOCM) is responsible for the management of the LEOC facility and ensuring LEOC staff are supported during an incident. The LEOCM is also responsible for ensuring the Situation Report or Senior Leadership Brief is completed at regular intervals and contains timely and accurate information.

The primary responsibilities of the LEOCM include, but are not limited to:

- Ensure that the LEOC facility is properly equipped and prepared for activation at any given moment.
- Help establish appropriate LEOC staffing levels and monitor organizational effectiveness.
- Assist with responsibilities as requested by the IC.
- Provide translation services, if possible.
- Provide any support for EOC system(s) as needed by LEOC staff.
- Ensure that coordination among Sections is accomplished effectively.

Safety Officer

The Safety Officer (SOFR) is responsible for coordinating the appropriate response to address work-related health and safety issues for all personnel responding to an emergency including external contractors. All industrial-related injuries and illnesses must be reported in accordance with LUMA's safety procedures, which contain instructions for completing documentation associated with injuries and illnesses arising during work-related activities.

The primary responsibilities of the SOFR include, but are not limited to:

- Support the mitigation of hazardous situations as identified.
- Exercise emergency authority to stop and prevent unsafe acts.
- Communicate with employees and contractors about responsibility and exercising emergency authority to prevent or stop unsafe acts when immediate action is required.
- Review the IAP for safety implications and provide safety messages for inclusion in the IAP.
- Assign staff assistants qualified to evaluate special hazards.
- Ensure all applicable workplace safety rules and policies are complied with during the restoration effort.
- Recommends measures for assuring employee safety, public safety, and the protection of LUMA employees.
- Allocates local Safety, Health, and Environmental personnel to affected branches.
- Oversee and ensure that an initial safety briefing is conducted with all arriving mutual aid and contractor crews and provide safety briefing documents each day during the restoration process for all LUMA employees and mutual aid or contractors.
- Ensure prompt investigations occur following a significant safety near-miss or actual event.
- Notify the IC of any significant events or conditions related to worker health and safety.
- Additional responsibilities as assigned by the IC.

Medical Unit Leader

The Medical Unit Leader (MEDO) is responsible for ensuring the occupational health of all incident personnel, including planning for and coordinating incident emergency response. Incident emergency response often involves MEDO coordination of patient evacuations/extractions from remote areas, requiring good knowledge of available resources and their capability.

The primary responsibilities of the MEDO include, but are not limited to:

- Support the mitigation of hazardous situations as identified.
- Determine the level of medical services required and coordinate activities of medical personnel and auxiliary certified industrial first-aid attendants.
- Prepare Medical Emergency Plan (ICS Form 206)
- Arrange for ambulance services and establishment of a field medical station.
- Establish and verify emergency medical transportation and communications procedures.
- Respond to requests for medical aid, medical transportation, and medical supplies.
- Establish a record-keeping system for recording accidents and illness occurrences, inventory of supplies, key contacts, phone numbers, etc.
- Address medical needs for extended and/or escalated field response.

Public Information Officer

The Public Information Officer (PIO) is responsible for the management of all communications regarding incident information. Incident information such as customer interruptions, resource acquisitions, system damage, and restoration progress is managed in accordance with the communication protocols established by the LUMA Executive Team. The PIO and staff have overall responsibility for crafting response information to be disseminated to external and internal stakeholders upon approval by the IC including:

- Media Outlets
- Employees
- Customers
- Municipal Officials
- Regulatory
- Governor's Office
- Puerto Rico Emergency Management Bureau (PREMB)

Other responsibilities of the PIO include, but are not limited to:

- Ensure the maintenance of contact lists including print and electronic media contacts. Lists are maintained through the effective usage of a variety of computer software applications including databases, spreadsheets, and others.
- Ensure customer outage estimated times of restoration (ETRs) are broadcasted across all available LUMA platforms.
- Ensure unity of message to all stakeholders.
- Provide employees with timely, accurate information to support situational awareness.
- Develop accurate, accessible, and timely information for use in press/media briefings.
- Determine any limits on information releases according to direction from the IC.
- Obtain the IC's approval of news releases.
- Conduct periodic media briefings and/or disseminate news releases to media outlets.
- Arrange for tours and other interviews or briefings that may be required.
- Monitor and forward media information that may be useful to incident planning.

- Maintain current information, summaries, and/or displays on the incident.
- Make information about the incident available to incident personnel.
- Ensure that all subordinate positions execute their specific duties and responsibilities.

Digital Communications Specialist

The Digital Communications Specialist (DIGC) provides multiple means of receiving response information for employees, customers, media, and other key stakeholders. This position reports to the PIO.

The primary responsibilities of the DIGC include, but are not limited to:

- Update the LUMA website with appropriate information related to the event.
- Distribute appropriate safety, preparedness, and restoration information via various social media outlets as appropriate.
- Monitor social media outlets and respond to inquiries.
- Provide updates related to digital communication channels to the PIO as needed.

Employee Communications Specialist

The Employee Communications Specialist (ECOM) is responsible for providing daily updates to LUMA employees through emails and postings regarding the incident and LUMA's response operations.

The primary responsibilities of the ECOM include, but are not limited to:

- Aid the PIO in crafting employee messages and distributing approved materials to employees at appropriate times.
- Respond to employee inquiries for information related to the incident.
- Provide updates to the PIO regarding employee issues as appropriate.
- Ensure employee-focused communications are timely, accurate, and effective.
- Coordinate with the DIGC to ensure continuity of messaging.

Liaison Officer

The Liaison Officer (LNO) serves as the primary point of contact for external representatives such as a Multi-Agency Coordination (MAC) Group, local government and/or federal agencies, in accordance with the LUMA Major Outage Event Metrics, found in Appendix A of the Major Outage Event Restoration Annex (Annex A). The LNO coordinates the assignment of requested LUMA personnel to PREMB's EOCs and the PREMB Regional Emergency Operations Centers (REOCs), and coordinates response and support activities with other government response agencies.

The LNO is responsible for facilitating communication between two or more organizations or agencies with LUMA. The LNO collaborates with all LNO stakeholders to monitor, coordinate, and communicate the strategic objectives of LUMA as it relates to Transmission and Distribution (T&D). The LNO proactively solves conflicts and addresses issues that may occur between LUMA and other agencies. The LNO develops and fosters relationships with the community and LNO partners and serves as the conduit to the IC upon activation of the LEOC.

The primary responsibilities of the LNO are to effectively coordinate with LNO stakeholders of participating organizations in support of the incident.

This includes, but is not limited to:

- Serve as the primary contact to the IC for LNO stakeholders during LEOC activations.
- Serve as the primary point of contact for all LNO stakeholders who are not represented on the ERO and ensure their concerns, input, objectives, and issues are effectively addressed by the response effort.
- Maintain a list of assisting and cooperating agencies and Agency Representatives, including name and contact information.
- Monitor check-in sheets daily to ensure that all Agency Representatives are identified.
- Periodic maintenance of contact lists which include:
 - Local emergency management and response personnel
 - PREB, P3A, and PREMB personnel

LUMA PREMB Liaison Officer

The LUMA PREMB Liaison Officer (PLNO) serves as the single LUMA point of contact for PREMB. The PLNO sits in the PREMB EOC to keep agencies from the Government of Puerto Rico informed and speaks on behalf of LUMA at operational period briefings and other requests for information. The PLNO works closely with the LUMA LNO to ensure continuity of messaging and to keep the LEOC informed as to the information being shared in the PREMB EOC.

The primary responsibilities of the PLNO include, but are not limited to:

- Ensure an open communication channel between LUMA and PREMB during an outage event.
- Provide the requested information and status updates regarding LUMA operations to PREMB.
- Ensure unity of messaging from LUMA to PREMB.
- When activated, work out of the PREMB EOC, and liaise with the LEOC.

PREB and P3A Liaison Officer

The PREB and P3A Liaison Officer (P3LNO) serves as the single point of contact for LUMA to the PREB and P3A. The PL3NO sits in the LEOC and ensures the PREB and P3A are kept abreast of any incident and LUMA's response actions, anticipated response actions, and any other information as requested from PREB and P3A. The P3LNO works closely with the LUMA LNO to ensure continuity of messaging in the information being shared with those agencies.

The primary responsibilities of the P3LNO include, but are not limited to:

- Serve as the liaison between LUMA, PREB, and P3A during an outage event.
- Anticipate requests from PREB and P3A.
- Provide the requested information and status updates regarding LUMA operations to PREB and P3A.
- Ensure unity of messaging from LUMA to PREB and P3A.

LUMA Generation Liaison Officer

The LUMA Generation Liaison Officer (GLO) is responsible for liaising with the generation industry across the island. The GLO is in the LEOC and maintains current contact information for all generation companies that contribute to the Transmission and Distribution system. The GLO also coordinates any assistance and resource involvement throughout an incident with the generation companies. The GLO works closely with the LUMA LNO to ensure continuity of messaging in the information being shared with those organizations.

The primary responsibilities of the GLO include, but are not limited to:

- Ensure an open communication channel between LUMA and generation industry contacts during an incident.
- Implement the Liaison Communication SOG.
- Facilitate requests for resources with generation contacts.
- Ensure unity of messaging between LUMA and generation industry contacts.

Community Relations Specialist

The Community Relations Specialist (CRS) serves as a liaison for information sharing between the PREMB LUMA Regional Interagency Coordinators (LRIACs) and the LEOC. This position works directly with the PREMB LRIACs to collect information on community and customer power outages while monitoring and accessing the information in the PREMB Computer Aided Dispatch (CAD) and WebEOC applications. The CRS compiles and reconciles this information with LUMA's Call Center Express data and reports it to the LNO at the LEOC.

The primary responsibilities of the CRS include, but are not limited to:

- In-depth knowledge of PREMB CAD, WebEOC, and LUMA's Call Center to do analysis and reconciliation of information that becomes actionable intelligence.
- Utilize strong analytical skills, an understanding of customer service and other utility processes, and functional Customer Care & Billings (CC&B) knowledge to achieve strong performance metrics and a positive community and customer experience.
- Identify, develop, and implement creative solutions to address and reduce future community and customer complaints and support a positive customer experience.
- Develop collaborative workflow processes with Operations and Customer Experience.

Customer Experience Specialist

The Customer Experience Specialist (CUSE) is the Voice of the Customer at the LEOC. This team monitors customer complaints and general overall customer feedback and satisfaction. Responsibilities include, but are not limited to:

The primary responsibilities of the CUSE include, but are not limited to:

- Providing the Incident commander (IC) with any impacts on the customers in affected or non-affected areas.
- Ensuring the Customer Experience teams are adequately staffed for the expected emergency and staffing plans are made to ensure proper customer service throughout the incident.
- Monitors and provides feedback to Command Staff that the information from the PIO and Communications team regarding emergency response efforts are communicated to our customers.
- Oversees and provides feedback on LUMA's information supplied to Community Lifeline Customers and Lifeline Residential Service (LRS) customers to ensure the information is timely and accurate.
- This position gives overall guidance for LEOC's objectives to ensure the customer's voice is heard.

Section Assistant

During LEOC activations, the Section Assistant (AST) provides administrative assistance and support to the IC as needed. The AST also serves as the scribe for the Command Staff and is responsible for documenting section activities and other duties as assigned by the IC. The Command AST also coordinates with other ASTs as necessary to ensure the effective use of SharePoint and other information-sharing systems.

The primary responsibilities of the AST include, but are not limited to:

- Ensure each position maintains a log of important information and activities.

- Maintains a complete and accurate record of all actions and key decisions that occur during and after the incident.
- Take notes at meetings attended by the IC.
- Compile notes and other significant pieces of information into situational updates/reports.
- Answer Command Section desk phone(s) if staff are busy and unable to answer.

General Staff Overview

The General Staff represents and is responsible for the key functional aspects of the Incident Command structure organized into functional Sections. Each of the following Sections is led by a Section Chief who serves as the key position responsible for that function:

- Operations
- Logistics
- Planning and Intelligence
- Finance and Administration

General guidelines related to General Staff key positions include the following:

- Members of the General Staff report directly to the IC. If a Section Chief position is not activated, the IC has responsibility for that function.
- Only one person is designated as Section Chief for each Section.
- Deputy positions are established for each of the Section Chief positions. Deputies are individuals fully qualified to fill the primary position. Deputy Section Chiefs may be assigned supervisory responsibility for specific Regions, Branches, or Units within their Section.
- Section Chiefs may exchange informal information with any person within the organization. However, Task Assignment, Resource Requests, and other formal communication takes place through the formal chain of command.

General Staff – Operations Section

The Operations Section is responsible for directing the response and restoration activities following an emergency event. The Section is led by the Operations Section Chief and is comprised of the following positions:

- Operations Section Chief (OSC)
- Deputy Operations Section Chief (D/OSC)
- West Division Branch Director (WBD)
- East Division Branch Director (EBD)
- Priority Restoration Group (PRG) Branch Director
- T&D System Operations Branch Director (TDO)
- Air Operations Unit Leader (AOUL)
- Debris Management Unit Leader (DML)
- Damage Assessment Unit Leader (DAL)
- Section Assistant (AST)

The Operations section manages field operations required to resolve problems arising from an event's impact or emergency incident including, but not limited to:

- Dispatching work to crews and tracking crew locations.
- Coordination of pole sets.
- Directing and managing down wire activities.
- Track reported down wires and dispatching appropriate resources to remedy or stand by to make the area safe.
- Create achievable restoration objectives.
- Ensure outages are restored within the projected global estimated time of restoration (ETR) and communicated, as required.
- Assist in developing a Regional IAP.
- Coordinate with the Planning and Intelligence Section for adequate resource and restoration monitoring.
- Ensure the Planning and Intelligence Section Chief (PSC) and LSC are aware of meals and lodging needs.

Operations Section Chief

The Operations Section Chief (OSC) is responsible for overseeing the response to the incident, making the necessary repairs to the system, and managing all tactical operations to achieve objectives, with guidance from the Incident Action Plan (IAP). The OSC advises all Command Staff regarding the status of tactical operations. The OSC makes staffing assignments for the Operations Section and ensures adequate staffing. All Operations Section tasks are accomplished by the OSC when subordinate staff is not activated.

The primary responsibilities of the OSC include, but are not limited to:

- Prioritize the safety of tactical operations.
- Assist the IC in establishing incident objectives and recommends alternate strategies for the response as required.
- Develop and supervise the operations portion of the IAP.
- Direct and manage tactical restoration operations.
- Request additional resources to support tactical operations.
- Approve release of resources from active operational assignments.
- Brief Operations staff and communicate with LEOC leadership.
- Maintain situational awareness about the overall response and related tactical needs.
- Maintain close contact with Incident Commander (IC) and subordinate Operations personnel.
- Ensure the positions within the Section execute their position-specific duties and responsibilities.
- Prepare and submit requested reports/documents to IC.
- Ensure operational objectives are updated.
- Ensure adequate and timely progress towards meeting goals and considers alternate strategies.

Deputy Operations Section Chief

The Deputy Operations Section Chief (D/OSC) is just as qualified to fill the role of Operations Section Chief (OSC) in their absence and can manage oversight of the Units within the Operations Section.

The primary responsibilities of the D/OSC include, but are not limited to:

- Be prepared to assume the role of OSC.
- Assist in maintaining mission flow and documentation.

- Oversee and support all Operations Unit Leaders and Directors.
- Keep mission tracking systems updated and accurate.
- Maintain situational awareness regarding Operations matters.

West and East Division Branch Directors

The West Division Branch Director (WBD) and the East Division Branch Director (EBD) are responsible for overseeing the response to the event throughout their division, making the necessary repairs to the system, and for managing all tactical operations and resources to achieve that objective, with guidance from the Incident Action Plan (IAP).

The primary responsibilities of the WBD and EBD include, but are not limited to:

- Manage the Operations Regional Commanders.
- Assure the safety of tactical operations.
- Develop and supervise the operations portion of the IAP.
- Direct and manage tactical restoration operations.
- Request additional resources to support tactical operations.
- Approve release of resources from active operational assignments.
- Initiate or approve changes to the IAP regarding operational tactics.
- Maintain close contact with IC and OSC.
- Provide updates to the OSC and/or D/OSC on regional operations at regular intervals.

Priority Restoration Group Branch Director

The Priority Restoration Group (PRG) Branch Director is primarily responsible for the priority restoration of electrical service. The PRG Branch Director operates in a centralized or decentralized environment as required. The PRG Branch Director utilizes the Outage Management System (OMS), STORMs, and system control centers to direct the activities of the PRG.

The primary responsibilities of the PRG Branch Director include, but are not limited to:

- Schedule crews according to predetermined shifts.
- Disseminate dispatch instructions to crews.
- Conduct close-out of STORMs and OMS tickets with crews to receive reports on the nature of the work completed regardless of the manner of dispatch.
- Conduct follow-up phone calls and/or emails when work is completed including notification to the Customer Experience Team as needed, Community Affairs, and Regional and Municipal agencies.
- Maintain communications with an assigned contact in the LEOC to address unique or emergency situations.
- Work with Operations to complete the training of PRG line crews and provide training updates as needed.

T&D System Operations Branch Director

T&D System Operations Branch Director (TDO) is responsible for the safe and efficient operation of the Transmission and Distribution Grid. Through the utilization of real-time SCADA, Generation inputs and line capacities, the system operations team controls and directs all the system activities to ensure a stable and functional grid is maintained across the island(s).

The critical business function of the System Operations Center is the real-time operation of the BES (Bulk Electric System) and non-BES assets operated by LUMA. They direct all operations regarding transmission and distribution of the power grid

and primarily consists of Dispatch Control Center functions that manage the real-time operations of LUMA's BES. The control room monitors, and addresses information received to conduct planned or unplanned operational requirements of the system. At the direction of the TDO, the dispatch control center follows specific procedures including those for emergency response execution and black-start operations as necessary and in accordance with the System Operation Principles.

The primary responsibilities of the TDO include, but are not limited to:

- Control what comes on or off the system from a Generation, substation, and line perspective.
- Direct all operational requests and requirements to field personnel.
- Isolate the grid as necessary during system constraints or lack of capacity.
- Provide field resourcing needs to planning and intelligence teams.
- Provide IC and LEOC awareness of overall system capacity loading, issues, and priorities for the planning periods.
- Provide restoration priorities from a system perspective to the OSC and the PSC.
- Provide information to calculate estimated times of restoration (ETRs) as system conditions and status changes.

Air Operations Unit Leader

The Air Operations Unit Leader (AOUL) supervises all air operation activities, prepares the air operations portion of the IAP, implements its strategic aspects, and provides logistical support to aircraft operating on the incident.

The primary responsibilities of the AOUL include, but are not limited to:

- Ensure individual readiness.
- Obtain and assemble information and materials needed for the incident.
- Gather critical information pertinent to the incident.
- Participate in the preparation of the IAP.
- Ensure daily operational objectives and performance standards are met.
- Prepare for and participate in pre-planning/strategy meetings.
- Review local area aviation status, restrictions, and limitations if applicable. Obtain initial briefing from supervisor.
- Establish and communicate chain of command, reporting procedures, risk management processes, and aviation operational strategy.
- Determine the need for additional air support and calculate the amount and type of resources required. Ensure adequate staffing is in place to support anticipated activity.
- Assist in the development and implementation of the incident demobilization plan.

Debris Management Unit Leader

The Debris Management Unit Leader (DML) is responsible for leading the LUMA debris management system, which is a collection of personnel, facilities, technical expertise, and material resources which are designated for use in the clearance, removal, transport, sorting, storage, recycling, and ultimate disposal of disaster debris.

The primary responsibilities of the DML include, but are not limited to:

- Work with selected debris removal contractors, designated local (public and nongovernmental) support agencies and organizations, and involved state support agencies (as applicable).

- Assist in disaster debris management needs.
- Provide for the overall management and coordination of the debris management operation.
- Provide/coordinate resource support to the debris management operation (personnel, equipment, materials, vehicles, facilities, communications).
- Provide technical expertise in all facets of debris management operations.
- Coordinate with contractors, federal and state agencies, nongovernmental organizations (as applicable).
- Assist in the identification, establishment, operation, and closeout of required debris management support facilities.
- Monitor and track the activities and progression of the debris management operation.
- Establish and manage a system for receiving and addressing inquiries from the public, unsolicited contractors, etc.
- Provide operation-specific information for required reports, briefings, media releases, etc.

Damage Assessment Unit Leader

The Damage Assessment Unit Leader (DAL) is responsible for ensuring the detailed damage assessment from the regions is compiled to determine the extent of damage to the distribution system and to expedite the restoration of service to LUMA customers in accordance with the LUMA Major Outage Metrics, found in Appendix A of Annex A.

The DAL also uses damage assessment information to estimate the estimated time of restoration (ETR) in accordance with the LUMA Major Outage Metrics, and the number of resources, materials, and equipment needed to repair the system. The DAL works closely with the OSC to develop and distribute damage assessment summaries and the ETR.

The primary responsibilities of the DAL include, but are not limited to:

- Initiate and monitors the progress of damage assessment teams.
- Receives resource information from Logistics to determine the number of resources including damage assessors available for the event.
- Discuss damage assessment, projected ETR's, and projected number of restoration crew members, contractors, and resources required based on damage assessment.
- Compile damage assessment information into a system damage assessment spreadsheet to assess and determine the extent of damage to the system across impacted regions and develop ETRs, materials, equipment, and resources and submit them to the OSC.
- Participate in post-emergency reviews to identify lessons learned, as instructed.
- Provide documentation to the Documentation Unit Leader.
- Ensure documentation is submitted or stored appropriately and provide additional information as requested to aid in the development of the After-Action Report (AAR).

Section Assistant

The Section Assistant (AST) is a member of the Operations Section, documents LEOC activities, and serves as a scribe to assigned LEOC staff. The Section Assistant documents all activities and records information for the area assigned. Maintains a complete and accurate record of all events and key decisions that occur during and after the incident. Such records are written and may be documented in map form. The Operations AST coordinates with other ASTs as necessary to ensure the effective use of SharePoint or other information-sharing systems used.

The primary responsibilities of the AST include, but are not limited to:

- Ensure each position maintains a log of important information and activities.
- Maintain a complete and accurate record of all actions and key decisions that occur during and after the incident.
- Take notes at meetings conducted by the OSC.
- Compile notes and other significant pieces of information into situational updates/reports.
- Answer Operations Section desk phone(s) if staff are busy and unable to answer.

General Staff – Logistics Section

The Logistics Section provides the logistical and field support required to enable Operations personnel the ability to focus on the restoration of services. The Logistics Section is responsible for the coordination of logistical planning and logistical response activities. The Logistics Section is led by the Logistics Section Chief and is comprised of the following positions:

- Logistics Section Chief (LSC)
- Deputy Logistics Section Chief (D/LSC)
- Support Branch Director (SUPB)
- Supply Unit Leader (SUPL)
- Mutual Aid Unit Leader (MAA)
- Transportation/Fleet Unit Leader (TRUL)
- Corporate Security Unit Leader (CSL)
- Service Branch Director (SERB)
- Food/Lodging Unit Leader (FLUL)
- Food/Lodging Unit Support
- Donations/Volunteer Management Unit Leader (DVML)
- Facilities Unit Leader (FACL)
- Communications Branch Director (COMB)
- Information Technology Unit Leader (IT)
- IT Unit Support
- Communications Unit Leader (COML)
- Communications Unit Support
- Operational Technology Unit Leader (OT)
- Section Assistant (AST)

The main responsibilities for the Logistics Section include, but are not limited to:

- Acquire any outside resources, including line, tree, damage assessment, support, transmission, and other crews as requested by the PSC, as soon as possible.
- Ensure all acquired resources have adequate lodging, meals, materials, and transportation as requested.
- Establish and operate staging areas as determined by the IC and ensure the site has adequate capabilities.
- Ensure regional stockrooms and facilities are staffed with regional logistics personnel.
- Acquire all materials as requested and monitor the Materials Management System (MMS) to order or re-stock materials.

- Establish the administration and mobilization of vendor contracts related to supplies and services (i.e., on-site fuel and stock delivery, janitorial/sanitary facility service).
- Develop and manage transportation requirements, including acquiring additional vehicles as needed.
- Coordinate, acquire, and deploy mobile generators and other specialized equipment, as requested.
- Ensure the advanced planning and securing of critical resources and vendors.
- Develop, coordinate, and manage physical security requirements with the Puerto Rico Police Bureau and the respective municipal police commissioners.

Logistics Section Chief

The Logistics Section Chief (LSC) advises all Command and General Staff regarding the status of logistical operations and provides all incident resources to support the tactical execution of incident objectives. The LSC also provides all facilities, transportation, supplies, equipment maintenance, and fueling for incident personnel and all off-site resources.

The primary responsibilities of the LSC include, but are not limited to:

- Maintain situational awareness about the overall response and related logistics requirements.
- Ensure section objectives, as stated in the LEOC Incident Action Plan (IAP), are accomplished within the operational period as required.
- Ensure acquisition, distribution, and documentation of all requested resources.
- Ensure resources requested are maintained within the boundaries of fiscal, environmental, and other constraints.
- Coordinate the support of facilities, services, and materials in support of system restoration activities across multiple regions.
- Provide oversight, coordinate, and/or direct staging site operations.
- Identify and estimate service, support, and sustainment requirements for the current and future operational periods.
- When the LEOC is activated, it activates the Supply Unit to check the availability of resources and arranges for the delivery of necessary supplies.
- Coordinate site security at LUMA facilities during emergency response operations.
- Ensure the positions within the Section execute their specific duties and responsibilities.
- Oversee demobilization of the Logistics Section and associated resources.
- Undertake additional responsibilities as assigned by the LEOC IC.
- The LSC participates in LEOC planning meetings, reports the status of resources and shortfalls, and identifies areas where contingency planning/action is required.

Deputy Logistics Section Chief

The Deputy Logistics Section Chief (D/LSC) should have the same qualifications as the LSC and be capable of filling the role of the Logistics Section Chief (LSC) in the absence of the LSC.

The primary responsibilities of the D/LSC include, but are not limited to:

- Assume the role of LSC, if necessary.
- Assist in maintaining mission flow and documentation.
- Keep mission tracking systems updated and accurate.

- Maintain situational awareness regarding logistical requirements.
- Support the LSC as needed.

Support Branch Director

The Logistics Support Branch Director (SUPB) coordinates the activities of Support Branch Unit Leaders to ensure that all the LUMA resources under the control of the Logistics Section have their needs satisfied.

The primary responsibilities of the SUPB include, but are not limited to:

- Coordinate the location of all LEOC needs based on operational requirements.
- Establish the appropriate level of unit staffing within the Support Branch, continuously monitoring the effectiveness of the organization and modifying as required.
- Ensure branch objectives stated in the LEOC IAP are accomplished within the operational period or within the estimated time frame.
- Inform the Logistics Section Chief of all significant issues relating to the Support Branch.

Supply Unit Leader

The Supply Unit Leader (SUPL) is responsible for managing, receiving, and distributing resources including personnel, equipment, and supplies.

The primary responsibilities of the SUPL include, but are not limited to:

- Track the delivery of incident-related resources and supplies.
- Maintain an inventory of equipment and supplies.
- Anticipate resource and supply needs.
- Determine the type and number of resources to order.
- Coordinate contracts and resource orders with the Finance Section.
- Coordinate the return of reusable resources to serviceable condition.
- Participate in Logistics Section planning activities.
- Liaise with Staging Area Manager to maintain minimum resource requirements.
- Receive and respond to requests for personnel, supplies, and equipment.

Mutual Aid Unit Leader

The Mutual Aid Unit Leader (MAA) is responsible for utilizing the mutual aid agreements to benefit the response to and restoration of the transmission and distribution system. Electric utilities affected by significant outages frequently call on other utilities, pursuant to mutual assistance agreements, for assistance to help expedite response and restoration. Mutual aid assistance may be in the form of personnel, supplies and/or equipment and may be required to mitigate, repair, or restore the system to normal operations. Mutual aid assistance is either furnished by LUMA or requested by LUMA.

The primary responsibilities of the MAA include, but are not limited to:

- Develop LUMA's mutual aid agreements during "blue sky" days.
- Execute LUMA procedures for Mutual Assistance Requests and Mutual Assistance Responses.
- Coordinate closely with the Command Staff Liaison Unit.

- Assign a crew guide to the mutual aid crews.
- Provide the roster of crews to the System Emergency Restoration Team (SERT) Unit Leader.
- Verify personnel and equipment on the property; coordinate with the Logistics Section to establish lodging, meals, and transportation.

Transportation/Fleet Unit Leader

The Transportation/Fleet Unit Leader (TRUL) is responsible for coordinating the transportation of emergency personnel and resources by all available means, coordinating all public transportation resources, coordinating fleet usage and upkeep, and coordinating the emergency routes with the Operations Section.

The primary responsibilities of the TRUL include, but are not limited to:

- Plan, staff, and manage the Transportation/Fleet Unit to meet incident needs safely.
- Coordinate with the Logistics Section and other sections to help meet overall incident objectives.
- Manage support for out-of-service resources; transportation for personnel, supplies, food, and equipment; fueling, service, maintenance, and repair for vehicles and other ground support equipment; and development and implementation of the incident transportation plan.
- Establish or transition into a unit under the Logistics Section.
- Configure unit with personnel to support operations.
- Ensure transportation and fleet vehicles and equipment are properly maintained and in a safe condition to support the incident.
- Identify issues, resource needs, and shortfalls for the next operational period.

Corporate Security Unit Leader

The Corporate Security Unit Leader (CSL) is responsible for providing security for all LUMA properties and assets and for providing a safe and secure environment for all employees and contractors during emergency response efforts.

The primary responsibilities of the CSL include, but are not limited to:

- Provide management of contract security guard service.
- Provide coverage as needed at gate locations, equipment, staging areas, and motel/hotel parking areas for Line and Tree contractors, vehicles, and equipment.
- Establish and maintain a direct line of communication with local law enforcement entities to provide convoy escorts, advise on traffic concerns, and provide roadside safety details as needed.

Service Branch Director

The Service Branch Director (SERB) ensures the Logistics Service Branch functions are carried out in support of the LEOC and activity in the operational area(s). The SERB has the overall responsibility for the preparedness, planning, and coordination of a variety of logistical services including facilities, volunteer management, donations, food, and lodging.

The primary responsibilities of the SERB include, but are not limited to:

- Ensure all fixed and temporary facilities are adequately staffed and operational.
- Ensure all Corporate Security functions are carried out effectively.
- Ensure a process is in place to register volunteers and accurately track their donated time.
- Coordinate the activation of the official account designated for monetary donations.

- Identify community partners/locations willing to accept and hold physical donations.
- Contribute to the development of the IAP.

Food/Lodging Unit Leader

The Food/Lodging Unit Leader (FLUL) is responsible for managing the Food/Lodging Unit for emergency response and disaster response, and relief personnel.

The primary responsibilities of the FLUL include, but are not limited to:

- Coordinate with the operational groups the requirements for lodging and meal resources for LUMA and mutual aid resources.
- Maintain a listing of food and lodging resource locations and establish a meal plan with food vendors.
- Establish communications with hotel vendors to identify the availability of hotel rooms across the impacted region(s).
- Disseminate lodging requirements to staff and monitor for requirements to be satisfied.
- Document the number of rooms reserved, occupied and vacant by day for each hotel being used.
- Release rooms as required.
- Document all requirements, decisions, issues, and email logs.
- Provide a summary to the Logistics Section Chief daily per operational period.
- Coordinate feeding response personnel using field kitchens, contracted catering, and other available resources.
- Determine feeding needs at all incident facilities, including menu plans, facilities for food preparation and serving, potable water, and maintenance of the food service areas.
- Ensure staffs take appropriate health and safety measures during food preparation and service.
- Keep inventory of food and monitors food orders.
- Establish or transition into a unit under the Logistics Section.

Donations/Volunteer Management Unit Leader

The Donations/Volunteer Management Unit Leader (DVML) is responsible for coordinating the establishment of a formal volunteer reception process and ensuring all volunteers are officially registered. The DVML is also responsible for coordinating incoming donations from the public and organizations, both monetary and physical.

The primary responsibilities of the DVML include, but are not limited to:

- Identify a location to establish a Volunteer Reception Center to receive volunteers in an organized manner.
- Ensure a process is in place to register volunteers and accurately track their donated time.
- Coordinate the activation of the official account designated for monetary donations.
- Identify community partners/locations willing to accept and hold physical donations.
- Coordinate the activation of a Donations and Volunteer Management Team if capacity is exceeded.
- Maintain regular communications with representatives from all community partners involved in donation operations.

Facilities Unit Leader

The Facilities Unit Leader (FACL) is responsible for the maintenance and operation of all LUMA buildings, which are occupied during the outage event, to provide rest and sanitation facilities for incident personnel, and to manage base and camp operations.

The primary responsibilities of the FACL include, but are not limited to:

- Participate in Logistics Section planning activities.
- Determine requirements for each facility to be established, including the command post.
- Prepare and notify unit leaders of layouts of incident facilities.
- Activate incident facilities.
- Provide base and camp managers.
- Provide facility maintenance services – sanitation, lighting, and cleanup.
- Demobilize base and camp facilities.
- Provide roadside safety details as needed.

Communications Branch Director

The Communications Branch Director (COMB) ensures the Branch's functions are carried out in support of the LEOC and activity in the operational area(s). The COMB has the overall responsibility for the preparedness, planning, and coordination of a variety of logistical services including communications, IT, and OT.

The primary responsibilities of the COMB include, but are not limited to:

- Ensure all IT data and telecommunications systems (infrastructure and applications) are functioning effectively.
- Ensure all OT systems are functioning effectively.
- Provide all communications equipment necessary to provide effective, interoperable voice communications by and between all incident personnel.

Information Technology Unit Leader

The Information Technology (IT) Unit Leader is responsible for continuously assessing the event for IT-related logistical needs and obtaining and allocating resources as required to meet the demands of the event.

The primary responsibilities of the IT Unit Leader include, but are not limited to:

- Ensure equipment within the LEOC is operational. If repairs or maintenance is required, notify the IC.
- Notify the IC of any abnormal conditions in the system.
- Ensure spare cell phones for distribution are available.
- Ensure electronic transmission devices are available for use, printers, faxes, etc.
- Maintain voice and data communications system throughout the event.
- Contact critical communications and IT vendors to put them on advance notice of impending action.
- Provide maintenance on company-provided equipment, as requested.
- Dispatch IT Reps to locations to respond to IT issues.

Communications Unit Leader

The Communications Unit Leader (COML) is responsible for defining, programming, and maintaining LUMA's incident response communications equipment. The COML also provides data, telephone, and radio communications support for incident personnel. The Communications Unit is tasked with managing the operational and technical aspects of incident communications. As an incident grows, communications need to expand quickly.

The primary responsibilities of the COML include, but are not limited to:

- Provide for the operational and technical communications needs of the incident.
- Provide the Communications Plan ICS-205 component for the IAP.
- Coordinate needs for incident communications for Air Operations, T&D System Operations, and logistical section needs.
- Coordinate with Medical Officer for medical evacuation plan communications.
- Initiate and maintain accurate records of communications equipment.
- Design radio communications systems to meet incident needs.
- Provide needed communications equipment to contract and mutual aid resources.

Operational Technology Unit Leader

The Operational Technology Unit Leader (OTL) is responsible for ensuring continuity of key operational technologies, including OT applications availability, IT Support, dispatching, procurement, and workforce management.

The primary responsibilities of the OTL include, but are not limited to:

- Monitoring Operational Technologies (OTs) and systems to ensure adequacy and continuity of service.
- Restoring services to OTs when outages occur.
- Developing alternative solutions to OTs when service cannot be restored.
- Coordinating information with IT OT vendors and internal resources in response to OT issues.
- Working alongside the Planning and operations teams to help prioritize, repair, and deploy activities and services through the Network Operations Center (NOC)

Section Assistant

The Logistics Section Assistant (AST) is a member of the Logistics Section, documents LEOC activities, and serves as a scribe to assigned Logistics staff. The Section Assistant documents all activities and records information for the area assigned. Such records are written and may be documented in map form. The Logistics Section Assistant coordinates with other Section Assistants as necessary to ensure the effective use of SharePoint or other information-sharing systems used.

The primary responsibilities of the AST include, but are not limited to:

- Ensure each position maintains a log of important information and activities.
- Take notes at meetings conducted by the LSC.
- Compile notes and other significant pieces of information into situational updates/reports.
- Answer the Logistics Section desk phone(s) if staff are busy and unable to answer.
- Maintains a complete and accurate record of all actions and key decisions that occur during and after the incident.

General Staff – Planning and Intelligence Section

The Planning and Intelligence (P&I) Section is mainly responsible for the development and distribution of the IAPs, Situation Reports, internal and external reports, GIS mapping functions, and maintaining all incident documentation for record-keeping. The P&I Section is led by the Planning and Intelligence Section Chief and is comprised of the following positions:

- Planning and Intelligence Section Chief (PSC)
- Deputy Planning and Intelligence Section Chief (D/PSC)
- Resources Unit Leader (RESL)
- ETR Specialist (ETRS)
- Situation and Intelligence Unit Leader (SITL)
- OMS Specialist (OMSS)
- Geographic Information System (GIS) Unit Leader
- Situation and Intelligence Unit Staff
- Reporting Unit Leader (RUL)
- Regulatory Reporting Specialist (REGS)
- MOE Metrics Specialist (MOES)
- Documentation Unit Leader (DOCL)
- Documentation Unit Staff
- Check-In Staff (CHK)
- Section Assistant (AST)

The P&I Section's primary responsibilities include, but are not limited to:

- Monitor the weather forecast and provide updates.
- Manage and administer the overall effort of collecting, processing, and reporting emergency service restoration information, including overseeing the development and distribution of routine Restoration Status Reports (RSRs) and IAPs.
- Work with the Division Branch Directors (DBDs) to establish an accurate and timely reporting communication process to ensure restoration times are being provided by the regions.
- Determine the time frame for convening a pre-event meeting (pre-emergency) and initializing demobilization efforts.
- Document, maintain, and provide internal information about the status of the restoration effort to the IC and PIO.

Planning and Intelligence Section Chief

The Planning and Intelligence Section Chief (PSC) is responsible for conducting overall incident planning activities to support the response and restoration effort. This includes collecting situation and resource status information, evaluating, and processing the information for use in developing IAPs and estimated times of restoration (ETRs). The PSC assists the Incident Commander in establishing incident objectives and recommends alternate strategies for the response as required. The PSC also establishes the battle rhythm of the LEOC by scheduling operational period briefings, planning meetings, and various reporting timelines.

The primary responsibilities of the PSC include, but are not limited to:

- Collect, analyze, and manage all internal and external data, including damage assessments.

- Conduct and facilitate planning meetings.
- Compile and display incident status information.
- Supervise the preparation of the IAP.
- Provide input to the Incident Commander and Operations Section Chief in preparing the IAP.
- Establish information requirements and reporting schedules for units within Planning Section.
- Record and track both internal and external support resources utilized during an emergency event.
- Provide predictions on incident potential.
- Report significant changes in incident status.
- Ensure positions within the Section execute their specific duties and responsibilities.
- Oversee preparation of the Demobilization Plan.
- Oversee preparation and submission of Report Type I regarding customer outages and Report Type II regarding restoration resources.

Deputy Planning and Intelligence Section Chief

The Deputy Planning and Intelligence Section Chief should have the same qualifications as the PSC and shall:

- Be prepared to assume the role of PSC.
- Assist in maintaining mission flow and documentation.
- Keep mission tracking systems updated and accurate.

Resources Unit Leader

The Resources Unit Leader (RESL) is responsible for establishing all incident check-in activities, preparing resource status information; maintaining displays, charts, and lists that reflect the status and location of resources, transportation, and support vehicles; and maintaining a master check-in list of resources assigned to the incident, including personnel and equipment. These resources may be LUMA-owned, contracted, rented, or mutual aid assets.

The primary responsibilities of the RESL include, but are not limited to:

- Assemble resource display materials.
- Assign duties to resource unit personnel.
- Establish check-in function at incident locations.
- Establish and maintain a resource tracking system.
- Establish the command post display on team organization and resources allocated based on the incident briefing form (ICS Form 201).
- Confirm dispatch and estimated time of arrival of response personnel.
- Gather, post, and maintain incident resource status, as well as the status of transportation and support vehicles and personnel.
- Maintain a master roster of all resources checked in at the incident.
- Prepare organization assignment list (ICS Form 203) and organization chart (ICS form 207).
- Prepare appropriate parts of division assignment lists (ICS form 204).
- Provide resource summary information.

- Coordinate the demobilization of resources that are no longer needed, and document when each resource is demobilized.

ETR Specialist

The ETR Specialist is responsible for collecting information related to estimated times of restoration (ETRs) and updating the Outage Management System (OMS) so the information is relevant to disaster operations. The ETR Specialist is responsible for developing a global ETR between 24 and 48 hours after the storm's passage and/or it is safe to commence work based on damage assessments, resources, and available crews. The ETR Specialist works closely with the Regulatory Reporting Specialist to assist in providing ETRs for the outages that are reported by the OMS Specialist. The ETR Specialist reports to the Situation and Intelligence Unit Leader and works in the Planning section of the LEOC.

Situation and Intelligence Unit Leader

The Situation and Intelligence Unit Leader (SITL) is responsible for collecting and organizing incident status and situation information. The SITL is responsible for the evaluation, analysis, and display of that information for use by response personnel. The SITL reports to the Planning and Intelligence Section Chief (PSC) and works in the Planning area.

The primary responsibilities of the SITL include, but are not limited to:

- Report to PSC for situation briefing.
- Assemble incident status display materials.
- Assign duties to situation unit personnel.
- Collect incident data.
- Prepare predictions at intervals or upon request of the PSC.
- Prepare and maintain command post-incident status display.
- Arrange for internet-based situation reporting, if required.
- Participate in incident planning meetings.
- Prepare the Incident Status Summary Form (ICS Form 209).
- Provide photographic services and maps.
- Provide resource and situation status information in response to specific requests.
- Maintain situation unit records.
- Demobilize unit on request.

OMS Specialist

The OMS Specialist (OMSS) is responsible for collecting information from the Outage Management System (OMS) related to the outages and system status to support the disaster operations. The OMS Specialist works closely with the Regulatory Reporting Specialist to assist in providing information regarding outages, so they are reflected in the Restoration Stage Reports.

The primary responsibilities of the OMSS include, but are not limited to:

- Routinely collect OMS data from the T&D System Operations Control Center before, during, and after an emergency.
- Share OMS data with the IC and the P&I Section.
- Monitor the Control Center and the OMS.

- Answer any questions LEOC Staff may have on system outages.
- Ensure OMS data is incorporated into Incident Action Planning.
- Triage information with the Estimated Time of Restoration (ETR) Specialist.

GIS Unit Leader

The Geographic Information System (GIS) Unit Leader coordinates to prepare the incident maps and displays by collecting and interpreting information.

The primary responsibilities of this position include, but are not limited to:

- Participate in functional area briefings and after-action reports.
- Define, implement, and maintain a daily archival process.
- Provide written documentation, digital data, and products developed during the incident to the Documentation Unit and others.
- Assist in producing incident products by the completing digital analysis.
- Develop, update, and maintain metadata.
- Coordinate with Situation and Intelligence Unit Leader to prepare incident maps and displays by collecting and interpreting information.
- Produces and updates maps within established guidelines and time frames.

Reporting Unit Leader

The Reporting Unit Leader (RUL) completes all regulatory reports and is responsible for understanding the T&D OMA Emergency Event Reporting Requirements. They are responsible for maintaining an information exchange between LUMA Energy, PREMB, P3A, and additional federal agencies as appropriate. They collect information in the LEOC to be included in external reports to the P3A and PREB. They get report information approved internally prior to providing it to the REGS and the P3LNO for external distribution. They work with the Command Staff, the Operations Section Chief, and the Planning and Intelligence Section Chief to collect information, get reports approved, and have information distributed through the appropriate channels.

The primary responsibilities of the RUL include, but are not limited to:

- Collecting Estimated Time of Restoration (ETR) data from the ETR Specialist (ETRS) and collecting Resourcing information from the Resources Unit Leader (RESL).
- Complete the Pre-incident Stage Report, Restoration Stage Report Type I & II, and a Final Event Report.
- Complete restoration reports every 24 hours, at a minimum.
- Obtain approval of internal report information prior to external report distribution.
- Review external reports for distribution to the PREB and P3A.

Regulatory Reporting Specialist

The Regulatory Reporting Specialist (REGS) is responsible for understanding the T&D OMA Emergency Event Reporting Requirements and ensures compliance with reporting requirements under the T&D OMA during an Emergency Event. The REGS supports the RUL in completing all regulatory reports, both internal and external, as required. The REGS is responsible for maintaining an information exchange between LUMA Energy, PREMB and P3A, and other federal agencies as appropriate. The REGS is responsible for inputting information from the approval reports into external report templates for distribution to the P3LNO. The REGS works with the Command Staff, the Operations Section Chief, and the Planning

and Intelligence Section Chief to collect information, get reports approved, and have information distributed through the appropriate channels.

The primary responsibilities of the REGS include, but are not limited to:

- Support the RUL to collect information in the LEOC and develop internal reports for approval including, but not limited to, the Pre-incident Stage Report, Restoration Stage Report Type I & II, and a Final Event Report.
- Support completion restoration reports every 24 hours, at a minimum.
- Complete external reports with information approved by the Incident Commander and coordinate with P3LNO for the final distribution of reports to the PREB and P3A.

MOE Metrics Specialist

The Major Outage Event (MOE) Metrics Specialist (MOES) ensures reporting requirements associated with MOE metrics are completed. The MOES ensures that, during a MOE, LUMA delivers the required Daily Update to the PREB and P3A regarding MOE performance metrics (as approved by the PREB). The MOES works closely with the PREB and the P3LNO to ensure the required MOE performance metrics report is compiled and distributed daily to the PREB and P3A.

Responsibilities of the MOES include, but are not limited to:

- Understand the Emergency Response MOE performance metrics reporting requirements and who to collect each metric from.
- Collect daily data on the MOE performance metrics from various LEOC stakeholders.
- Draft and finalize the daily report.
- Coordinate final sign-off from the necessary approvers.
- Coordinate with Regulatory to get the P3A transmittal number and form.
- Coordinate with P3LNO for final daily distribution of reports to meet required deadlines.

Documentation Unit Leader

The Documentation Unit Leader (DOCL) is responsible for ensuring incident files are maintained, complete, and up to date in accordance with LUMA standards and policies.

The primary responsibilities of this position include, but are not limited to:

- Report to the PSC for situation briefing.
- Prepares and updates the Incident Action Plan for each operational period (reviewed by the PSC and approved by the IC).
- Establish a work area with files and a photocopier.
- Retain and file duplicates of official forms and reports.
- Accept and file reports and forms submitted to the unit.
- Check the accuracy and completeness of records submitted.
- Correct errors or omissions by contacting appropriate ICS Units.
- Provide duplicates of forms and reports to authorized requesters.
- Prepare incident documentation for Planning and Intelligence Section Chief when requested.
- Maintain, retain, and store incident files for use after demobilization.

Check-In Staff

The Check-In Staff is responsible for initiating LEOC check-in and check-out procedures and keeping track of all forms and sign-in sheets.

Section Assistant

The Section Assistant (AST) is a member of the P&I Section, documents LEOC activities, and serves as a scribe to assigned LEOC staff. The AST documents all activities and records information for the area assigned. Maintains a complete and accurate record of all events and key decisions that occur during and after the incident. Such records are written and may be documented in map form. The P&I AST coordinates with other ASTs as necessary to ensure the effective use of SharePoint or other information-sharing systems used.

General Staff – Finance and Administration Section

The Finance and Administration Section is responsible for all fiscal matters related to the emergency event. Finance and Administration Section staff are led by the Finance and Administration Section Chief (FSC) and is comprised of the following positions:

- Finance Section Chief (FSC)
- Deputy Finance Section Chief (D/FSC)
- Time & Cost Unit Leader (TCUL)
- Procurement Unit Leader (PROC)
- Claims Unit Leader (CLAL)
- Section Assistant (AST)

The primary functions of this position include, but are not limited to:

- Track all costs related to the event and ensure cost tracking and financing protocols are in place.
- Maintain accurate rosters and shift schedules of all responding internal personnel located in the LEOC and ROCCs, when applicable.
- Issue petty cash, procurement cards, and increasing limits on these as requested by the IC.
- Provide HR support and assistance programs to all employees and acquired resources.
- Provide procurement services for response and restoration activities.

Finance/Admin Section Chief

The Finance Section Chief (FSC) advises all Command and General staff about the fiscal, contract, and other administrative matters. The FSC makes staffing assignments for the Finance and Administration Section, distributes job descriptions for assigned staff, and ensures it is adequately staffed.

The primary responsibilities of the FSC include, but are not limited to:

- Track and manage all financial aspects of ERP activation.
- Track costs related to emergency restoration activities.
- Provide financial and cost analysis information as requested.
- Ensure compensation and claims functions are being addressed relative to the incident.
- Gather pertinent information from briefings with each Section.

- Develop an operating plan for the Finance/Administration Section and fill the supply and support needs of the Section.
- Maintain daily contact with the LUMA CFO on finance matters.
- Ensure that personnel time records are completed accurately and in a timely fashion.
- Ensure that all obligation documents initiated during the ERP are properly prepared and completed.
- Brief LUMA administrative finance personnel on all incident-related financial issues needing attention or follow-up.
- Provide input to the IAP.

Deputy Finance/Admin Section Chief

The Deputy Finance Section Chief (D/FSC) should have the same qualifications as the FSC and be capable of filling the role of the Finance Section Chief (FSC) in the absence of the FSC.

The primary responsibilities of the D/FSC include, but are not limited to:

- Assume the role of FSC, if necessary.
- Assist in maintaining mission flow and documentation.
- Oversee the Time & Cost Unit Leader, Procurement Unit Leader, Claims Unit Leader, and Section Assistant.
- Keep mission tracking systems updated and accurate.
- Maintain situational awareness regarding financial matters.
- The D/FSC may represent the FSC by participating in or leading Planning meetings.

Time & Cost Unit Leader

The Time & Cost Unit Leader (TCUL) is responsible for collecting all cost data, performing cost-effectiveness analysis, providing cost estimates and cost-saving recommendations, as well as ensuring personnel time is recorded according to agency policy.

The primary responsibilities of the TCUL include, but are not limited to:

- Establish cost reporting procedures.
- Maintain cost tracking, analysis, and estimates.
- Collect and track time records and personnel costs for employees and contractors.
- Document any unusual time or cost issues.
- Provide forms and procedures for time recording and obtain check-in lists.
- Prepare cost summaries that provide the total cost incurred and the average cost per day.
- Ensure that all records are current and complete before demobilization.
- Brief the Finance Section Chief (FSC) on current problems, recommendations, outstanding issues, and follow-up requirements. Document and report any contract violations, cost over-runs, and safety matters.
- Maintain a master record of crew time reports, invoices, receipts, order forms, contracts, etc.

Procurement Unit Leader

The Procurement Unit Leader (PROC) is responsible for administering the incident procurement process, managing financial matters pertaining to vendor contracts and agreements, and ensuring compliance with incident procurement policies.

The primary responsibilities of the PROC include, but are not limited to:

- Arrange for emergency accounts and coding for service contracts and purchases.
- Provide administration, finance forms, and procedures for purchases and contract management.
- Establishing contracts with supply vendors as required.
- Finalize contracts and agreements and obtain signatures from appropriate spending authorities.
- Maintain records of purchases and contracts.

Claims Unit Leader

The Claims Unit Leader (CLAL) is responsible for the overall management and direction of all administrative matters pertaining to compensation for injury and claims-related activities (other than injury) for an accident.

The primary responsibilities of the CLAL include, but are not limited to:

- Assist employees or contractors who are injured or involved in an incident-related accident during the incident with any related claims.
- Receive and coordinate all claims for loss related to the incident.
- Receive and process property claims from leased/rented properties, right of ways or other access required requirements.
- Manage the list of insured LUMA properties and equipment to include values.
- Ensure all claims documentation is submitted, filed, or stored appropriately.
- Ensure claims documentation complies with FEMA reimbursement requirements.
- Determine the status of accident and injury-related investigations.
- Ensure written authority of persons requiring medical treatment.
- Advise on the nature and status of all existing and potential future claims.
- Establish procedures for prompt notification of injuries or fatalities to Command Staff.

Section Assistant

The Section Assistant (AST) is a member of the Finance and Administration Section, documents LEOC activities, and serves as a scribe to assigned LEOC staff. The AST documents all activities and records information for the area assigned. Maintains a complete and accurate record of all events and key decisions that occur during and after the incident. Such records are written and may be documented in map form, when useful. The Finance and Administration AST coordinates with other ASTs as necessary to ensure the effective use of SharePoint or other information-sharing systems used.

The primary responsibilities of the Finance Section Assistant include, but are not limited to:

- Ensure each position maintains a log of important information and activities.
- Take notes at meetings conducted by the FSC.

- Compile notes and other significant pieces of information into situational updates/reports.
- Answer the Finance Section desk phone(s) if staff are busy and unable to answer.
- Maintains a complete and accurate record of all actions and key decisions that occur before, during, and after the incident.

Appendix C – Critical Facilities

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Category 1	Item 1.2	Value 1.1.2	Unit 1.1.2
Category 1	Item 1.3	Value 1.1.3	Unit 1.1.3
Category 1	Item 1.4	Value 1.1.4	Unit 1.1.4
Category 1	Item 1.5	Value 1.1.5	Unit 1.1.5
Category 1	Item 1.6	Value 1.1.6	Unit 1.1.6
Category 1	Item 1.7	Value 1.1.7	Unit 1.1.7
Category 1	Item 1.8	Value 1.1.8	Unit 1.1.8
Category 1	Item 1.9	Value 1.1.9	Unit 1.1.9
Category 1	Item 1.10	Value 1.1.10	Unit 1.1.10
Category 1	Item 1.11	Value 1.1.11	Unit 1.1.11
Category 1	Item 1.12	Value 1.1.12	Unit 1.1.12
Category 1	Item 1.13	Value 1.1.13	Unit 1.1.13
Category 1	Item 1.14	Value 1.1.14	Unit 1.1.14
Category 1	Item 1.15	Value 1.1.15	Unit 1.1.15
Category 1	Item 1.16	Value 1.1.16	Unit 1.1.16
Category 1	Item 1.17	Value 1.1.17	Unit 1.1.17
Category 1	Item 1.18	Value 1.1.18	Unit 1.1.18
Category 1	Item 1.19	Value 1.1.19	Unit 1.1.19
Category 1	Item 1.20	Value 1.1.20	Unit 1.1.20
Category 1	Item 1.21	Value 1.1.21	Unit 1.1.21
Category 1	Item 1.22	Value 1.1.22	Unit 1.1.22
Category 1	Item 1.23	Value 1.1.23	Unit 1.1.23
Category 1	Item 1.24	Value 1.1.24	Unit 1.1.24
Category 1	Item 1.25	Value 1.1.25	Unit 1.1.25
Category 1	Item 1.26	Value 1.1.26	Unit 1.1.26
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Category 1	Item 1.76	Value 1.1.76	Unit 1.1.76
Category 1	Item 1.77	Value 1.1.77	Unit 1.1.77
Category 1	Item 1.78	Value 1.1.78	Unit 1.1.78
Category 1	Item 1.79	Value 1.1.79	Unit 1.1.79
Category 1	Item 1.80	Value 1.1.80	Unit 1.1.80
Category 1	Item 1.81	Value 1.1.81	Unit 1.1.81
Category 1	Item 1.82	Value 1.1.82	Unit 1.1.82
Category 1	Item 1.83	Value 1.1.83	Unit 1.1.83
Category 1	Item 1.84	Value 1	

Appendix D – Sample Report Templates

Pre-Event Stage Sample Report Template

For known possible Emergency Events, a Pre-Event Stage Report is submitted daily, and if the event type changes or as requested.

LUMA Pre-Event Stage Report

- 1 Date and Time of Report**
- 2 Weather Forecast & Monitoring**
- 3 Planned Event Conference Calls**
(date/time)
- 4 Pre-event Communications with Public, Municipal Contacts & Elected Officials**
(describe communication methods)
- 5 Pre-event Notifications with PREB, P3A, PREMB, Critical Facilities & Lifeline Residential Services**
(describing communication methods)
- 6 Expected Event Classification Type and Changes to Event Classification Type**
(and all facts considered in determination)
- 7 Likelihood of LEOC Activation and Activation Level**
(date/time LEOC opens)
- 8 Forecasted Percentage of Customer Outages**
- 9 LUMA Resource Readiness**
(indicate actions taken and type/quantities)
- 10 Forecasted Number and Type of Total Resources Required**
(number of crews and full-time equivalents)
- 11 Number of External Resources Secured**
(by type and including the number of crews and full-time equivalents)
- 12 Estimated Duration of Restoration Operations**
- 13 Problems Anticipated / Encountered for Event**
- 14 Any Other Pertinent Information:**

Signature: _____

Date & Time: _____

Restoration Stage Sample Report

The information included in this report is current as of 0000 hrs on 2022-01-01.

In compliance with Section 5.14(b) of the Transmission and Distribution Operation and Maintenance Agreement (T&D OMA) and the LUMA Emergency Response Plan (ERP), LUMA is providing an update on LUMA's response to the Emergency Event as described below:

Summary of Emergency Event

Event Date	
Event Time	
Event Name	
Event Summary	

Summary of Current Situation – As of 0000 hrs

LUMA Event Classification	
LEOC Activation	
Customer Outage %	
Total Customers without Service	
Total Customers with Service	
Estimated Time of Restoration	
Status of Crews	
Additional Information	

Regional ETRs

Region/ Municipality	Total LUMA Customers	Total Customers Out	Outage %	Estimated Times of Restoration (ETR)
Arecibo		---		
Adjuntas		---		
Arecibo		---		
Barceloneta		---		
Camuy		---		
Ciales		---		
Florida		---		
Hatillo		---		
Jayuya		---		
Manati		---		
Morovis		---		
Utado		---		

Region/ Municipality	Total LUMA Customers	Total Customers Out	Outage %	Estimated Times of Restoration (ETR)
Vega Alta		---		
Vega Baja		---		
Bayamon		---		
Bayamon		---		
Catano		---		
Corozal		---		
Dorado		---		
Guaynabo		---		
Naranjito		---		
Toa Alta		---		
Toa Baja		---		
Caguas		---		
Aguas Buenas		---		
Aibonito		---		
Barranquitas		---		
Caguas		---		
Cayey		---		
Ceiba		---		
Cidra		---		
Comerio		---		
Culebra		---		
Fajardo		---		
Gurabo		---		
Humacao		---		
Juncos		---		
Las Piedras		---		
Luquillo		---		
Naguabo		---		
Orocovis		---		
San Lorenzo		---		
Vieques		---		
Yabucoa		---		
Mayaguez		---		
Aguada		---		
Aguadilla		---		
Anasco		---		
Cabo Rojo		---		
Isabela		---		
Lajas		---		
Lares		---		

Region/ Municipality	Total LUMA Customers	Total Customers Out	Outage %	Estimated Times of Restoration (ETR)
Las Marias		---		
Maricao		---		
Mayaguez		---		
Moca		---		
Quebradillas		---		
Rincon		---		
Sabana Grande		---		
San German		---		
San Sebastian		---		
Ponce		---		
Arroyo		---		
Coamo		---		
Guanica		---		
Guayama		---		
Guayanilla		---		
Juana Diaz		---		
Maunabo		---		
Patillas		---		
Penuelas		---		
Ponce		---		
Salinas		---		
Santa Isabel		---		
Villaba		---		
Yauco		---		
San Juan		---		
Canovanas		---		
Carolina		---		
Loiza		---		
Rio Grande		---		
San Juan		---		
Trujillo Alto		---		
Total				

Resource Readiness

Crew Type	Number Requested	Number in Service	Number Out of Service	Number in Rehab	Mutual Aid Requested	Federal Aid Requested	ETA for Requested Resources
Internal Line							
External Line							
Debris Removal							
Damage Assessment							
SERT							
Support							
Staging							

Final Event Report

The following information is included in LUMA's After Action Report (AAR) for Event Types (Types 3, 2, and 1). This information is made available within 30 days of the deactivation of the LUMA Emergency Operations Center (LEOC) for the specific event.

Event Restoration Duration Summary

- 1 **Company Name**
- 2 **Year**
- 3 **Event Name** (if any)
- 4 **Date/Time Event Start**
- 5 **Date/Time Event End**
- 6 **Event Duration** (in hours)
- 7 **Total Customers Served**
- 8 **Total Customers Affected**
- 9 **% of Customers Affected**
(relative to total customers)
- 10 **Highest Peak # of Customers Affected**
- 11 **Date and Time When Highest Peak of # of Customers Affected Occurred**
- 12 **Total Customers Outage Hours**
- 13 **Duration from Highest Peak to 95% Restored** (in hours)
- 14 **CAIDI Highest Peak to 95% Restored** (in hours)
- 15 **Duration from Highest Peak to 98% Restored** (in hours)
- 16 **CAIDI Highest Peak to 98% Restored** (in hours)
- 17 **Event CAIDI** (in hours)

CAIDI: Customer Average Interruption Duration Index

Priority Down Wires Summary

- 1 **Company Name**
- 2 **Event Name** (if any)
- 3 **Location** (City/Town Name)
- 4 **Priority Level**
- 5 **Date and Time Call Received**
- 6 **Date and Time First Company Resource Arrives on Scene**
- 7 **Time Between Call Received and First Company Resource Arrived on the Scene** (in hours)
- 8 **Date and Time of Repair**

Narrative Description

Provide a narrative describing the Emergency Event, including, but not limited to:

- weather monitoring
- weather experienced
- event classification
- crew acquisition (by type)
- customer outages
- damage experienced
- beginning time and completion of preliminary damage assessment and detailed damage assessment
- timing of restoration

Event Description

- Total number of customers served
- Total number of communities served
- Date and time storm hit service territory
- Date and time of first outage
- Date and time Governor declared state of emergency
- Total number of customer outages over the course of the event
- Total number of communities affected
- Total number of days of restoration
- Date and time of peak number of outages
- Number of customer outages and number of customers restored for each day of the event and restoration
- Number of total customer outages and number of total customers restored per hour of the event and restoration, in an active Excel spreadsheet
- Time and date of restoration of 95 percent of customers
- Time and date of final restoration to customers
- A single consolidated report based on the Stage Restoration reports. Data should include all necessary updates and corrections to its Stage Restoration reports and be submitted in an active Excel spreadsheet.
- A summary of all available resources (in crews and full-time equivalents), by day and resource type.

Weather

- Actual weather experienced
- A narrative description of LUMA's evaluation of weather forecasts before and during the event and copies of all supporting weather reports
- Maximum winds experienced
- Duration of inclement weather
- Type and amount of precipitation, including, but not limited to average amount of precipitation in service territory, and maximum amount of precipitation in service territory

Event Classification

- List and discuss all factors used to derive event classification types before, during, and after the event
- Describe any event classification type changes before, during, and after the event, and explain all factors supporting the change in classification

Equipment Damage

- Number of transmission lines affected
- List of transmission lines that became inoperative
- List of substations affected
- Number of distribution feeders affected
- Number of distribution feeders locked out
- Number of broken poles replaced – indicate location, size, and age of damaged poles
- Number of feet of primary and secondary conductor replaced – indicate type and size
- Number of feet of follow-up reconductoring remaining – indicate type and size
- Number of damaged transformers – indicate size, type, and age of damaged transformers
- Availability of replacement transformers
- Repairs made
- Estimate for repairs
- Switching necessary to re-route power with adequate sectionalizing points

Trouble Order System

- Number of trouble orders
- Identify and describe any problems encountered on LUMA's system
- Was there sufficient manpower available to operate the system
- If de-centralization occurred, identify and describe any problems encountered after decentralization

Wires-Down Operations

- Total number of Priority wires-down calls by priority level
- For each day of the event and restoration period include:
 - outstanding priority wires-down calls by priority level
 - completed priority wires-down calls by priority level – provide in an active Excel spreadsheet
- A summary of priority wires-down response – provide in an active Excel spreadsheet
- Number of non-priority wires-down calls

Crew Supplements

- For all crew counts, please include both the number of crews and full-time equivalents
- Total number of LUMA crews
- Number and type of crews from outside LUMA
- Total number of wires-down assessors

- Total number of damage assessors
- For each day of the Pre-event and Service Restoration Stage, total number of crews per day, by type (e.g., line crew, tree crew, wires-down crew, transmission crew, damage assessor)
- For each day of the Pre-event and Service Restoration Stage, number of crews deployed, by type, to each district
- For each day of the Pre-event and Service Restoration period, number of wires-down assessors and damage assessors used

Food and Lodging

- Summary of food and lodging-related activities, including lessons learned
- Helicopter
- Were helicopters available?
- How were the helicopters used?
- Communication
- Narrative description of Pre-event Stage, Service Restoration Stage, and Post-event Stage communication with:
 - public officials
 - the public
- Lifeline Residential Service (LRS) Customers
- Narrative description of Pre-event Stage, Service Restoration Stage, and Post-event Stage internal communication
- Identify all methods used for communication with the public, including a narrative description, the dates, and frequency or use
- Narrative description of Municipal Liaison process during Pre-event Stage, Service Restoration Stage, and Post-event Stage
- Number and locations of Municipal Liaisons

Signature: _____

Date & Time: _____



Emergency Response Plan

Annex A – Major Outage Restoration

LUMA ENERGY

OPERATIONS – EMERGENCY PREPAREDNESS

May 27, 2022

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1 Purpose

The purpose of LUMA's Major Outage Restoration Annex (Annex A) is to establish an operational and tactical comprehensive framework for responding to major outage restoration events. Annex A assists the Emergency Operations Team in carrying out the actions necessary to protect lives, maintain continuity of service, and protect property. It also provides the Puerto Rico Energy Bureau (PREB), the Puerto Rico Public-Private Partnerships Authority (P3A), the Puerto Rico Emergency Management Bureau (PREMB), and other agencies the guidance for how LUMA responds and prioritizes electrical system outages with Community Lifeline overarching principles. This Annex helps ensure the safety of the public and employees and implements an effective restoration strategy consistent Companywide.

2 Scope

Annex A applies to emergency events caused by any hazard or threat that results in, or could result in, a major potential impact on the integrity of the T&D System and/or a disruption of electrical service to LUMA customers. Additionally, the ERP applies to LUMA personnel and to any staff of LUMA, affiliate company employees, contractors, mutual aid resources, or any other personnel working at the direction or under the authority of LUMA.

For the purpose of Annex A, an Emergency Event is defined as a Level 3, 2, or 1 event. Non-emergency events are defined as Level 5 and 4 events. All five of these levels are described in the Event Classification and LUMA Emergency Operations Center (LEOC) Activation Table, located in Base ERP - Appendix A.

LUMA's Emergency Operational Boundaries (shown in Figure 3 of the Base ERP) are split geographically into the West Division and East Division. There are three Regions within each Division and twenty SERT Boundaries which are made up of 78 municipalities. For a description of the ERP Guiding Principles, refer to the ERP - Base Plan, Section 2.

3 Situation and Assumptions

3.1 Situation

The success of Annex A is predicated on LUMA's commitment to prepare and implement procedures outlined within Annex A and the ERP – Base Plan. The development of an After-Action Report (AAR) further enables ongoing improvement in LUMA's response and restoration processes. Execution of the appropriate responses to affect rapid and safe recovery is dependent upon the scalability of Annex A. The number of customers affected, and the magnitude of a major outage event vary, but the operational concept stays consistent. The level of recovery resources can be adjusted as needed.

LUMA is taking an aggressive approach to harden the T&D System across Puerto Rico in order to withstand major weather events. Through these efforts, major hurricanes like Maria could be less impactful to the T&D System which supplies critical energy to LUMA customers. Due to the configuration of Puerto Rico's T&D grid to the location of the generation, LUMA focuses the hardening on key transmission lines to distribute energy to key load centers. Critical system substation rebuilding is also another area of focus.

LUMA is committed to applying Necessary Maintenance Expense (NME) and FEMA funds to take the actions necessary to improve system resilience through storm hardening, thus reducing the size and frequency of service interruptions even during Major Events. This involves a multi-faceted approach, including:

- Hardening key Transmission Lines that distribute energy to key load centers.
- Hardening the Feeder Backbone (alternatively referred to as the mainline or main gut, normally the three-phase part of the circuit that runs unfused from the substation to the normally open ties to other circuits or the physical end of the circuit).
- Hardening Distribution Express Feeders that serve community lifelines:

- Targeting High-Risk Vegetation (excessive overhang or trees near lines that appear susceptible to falling during a major event) for proactive “hot spotting”.
- Testing and Inspecting Poles and Structures and remediating identified risks.
- Sectionalizing with strategic placement of reclosers (enhanced with directional finding capabilities) and addressing any unfused taps.
- Strategically placing of Lightning Arrestors.
- Performing physical inspections, identifying and categorizing deficiencies, and performing corrective maintenance on those deemed as requiring urgent or emergency action.
- Rebuilding of critical substations (particularly those susceptible to flooding), and
- Addressing the damaged or partially restored infrastructure caused by Hurricane Maria and recent seismic events.
- This two-pronged approach will, over time, result in continued and sustainable improvement in restoration performance while simultaneously reducing the number of customers experiencing outages during these major events.

3.2 Assumptions and Considerations

The ERP - Base Plan, Section 4, identifies the overall assumptions and considerations. Identified within this Annex are in addition to, but not be limited to, the following:

- Damaged sections of the electrical system may be de-energized and isolated, allowing service to be restored up to the point of damage, leaving the site safe until permanent repairs can be completed.
- Any delayed repairs are scheduled and completed in a timely manner.
- Assessments and the scheduling of needed repairs are conducted prior to discharging restoration crew resources.
- Mutual Aid Agreements or Memorandums of Understanding are maintained and activated when the scope of the incident requires additional resources beyond LUMA’s capabilities.
- Facilitate coordinated response efforts and share information prior to and during the event to assist in establishing a common operating picture and efficient response.

4 Organization

This section outlines the key functions of the various components and positions of the Storm Restoration organizational structure. An orderly and consistent flow of information between Operations, Communications, Logistics, and associated support organizations is necessary in times of emergency events. LUMA has seven Emergency Operations Centers (EOCs): one LEOC and six Regional Operations Command Centers (ROCC). Organizational charts indicating lines of authority and the interrelation between organizational groups are included in Appendix A.

4.1 LUMA Leadership

Prior to, and during major storm events, LUMA’s senior leadership maintains an on-going open dialogue to discuss and share intelligence regarding an impending emergency event that may affect the electric system. This proactive dialogue ensures the most complete and timely “situational awareness” between leadership teams. It provides a platform to facilitate discussions regarding the potential sharing of personnel resources and other support functions between entities.

This coordinated approach is also important to the overall restoration response from a communications perspective, as it provides the mechanism for consistent messaging to employees, customers, and other external stakeholders. With the threat of a major storm or another system emergency, LUMA’s leadership team, through the Crisis Management Committee, activates all applicable functional areas (i.e., Operations, Planning & Intelligence, Logistics, and Finance/Admin) to discuss and strategize a response to an event.

4.2 Emergency Response Organization

An overview of LUMA's Emergency Response Organization (ERO) and General Staff structure utilized during restoration activities can be found in the Base Plan, Appendix A. Please refer to LUMA's ERP – Base Plan for a list of roles and responsibilities.

4.3 Employee Staffing Roster

LUMA maintains an employee contact sheet for all roles detailed within the Incident Command System (ICS) Restoration Roles and Responsibilities in Table 1. LUMA continues to update the list annually or when required, due to personnel changes and/or updates.

5 Roles and Responsibilities

Table 1 details the key leadership roles during restoration operations and delineates corresponding significant function(s) coordinated in the respective areas specific to Major Outage Restoration activities.

5.1 LEOC Actions by Position

Actions by Incident Command System Position			
Responsibility	Pre-Event	During Event	Post Event
Incident Commander (IC)	<ul style="list-style-type: none"> Once notified of a pending emergency event, begin an Activity Log (ICS 214) to document actions and decisions throughout the event. Review all related policies, procedures, forms, and templates used during an event to ensure accuracy. Initiate activities for appropriate resource acquisition and internal mobilization. Initiate Pre-Event notifications and reports to regulatory, municipal, and elected officials, when applicable (for Event Levels 1-3). 	<ul style="list-style-type: none"> Ensure public safety maintains the highest priority during restoration efforts and oversee restoration activities at the LEOC including resource acquirement and release, and demobilization. Review and approve the IAP for the next operational period and continually reassess restoration response and objectives to ensure it addresses event escalation issues. Establish a communication process and protocol to transfer restoration information to customers, regulators, and employees in a timely manner. Using the information obtained from the different functions, determine if you need to alter response objectives/priorities and communicate any changes to the IC organization. 	<ul style="list-style-type: none"> Ensure a proper demobilization of all restoration activities. Initiate a post-emergency review to identify lessons learned via hot washes and after-action review meetings. Ensure all documentation is submitted or stored appropriately and provide additional information as requested to aid in the development of the AAR for the event. Ensure the development of an AAR when necessary and the implementation of resulting lessons learned.

Actions by Incident Command System Position

Operations Section Chief (OSC)	<ul style="list-style-type: none"> • Ensure the staffing rosters for the • Operations Section positions are up to date and ready to be used. • Following activation of the Incident Management Team, activate the appropriate Operations Section personnel, as needed. • Verify with the Branch Directors that all Operations positions are sufficiently staffed and that arrangements are made for 24-hour coverage, if necessary. 	<ul style="list-style-type: none"> • Obtain a preliminary assessment of the number of customers affected and assist in the development of restoration plans. • Oversees the conversion of the IAP's strategic goals into executable tactical plans that implement LUMA's restoration priorities. • Monitors the overall effectiveness of the field restoration activities to accomplish the stated IAP goals. • Ensure the Planning and Logistics Sections are • aware of the operational resource requirements and are requesting and obtaining the necessary additional resources. • Ensure adherence to the restoration priorities • with all actions. 	<ul style="list-style-type: none"> • Ensure a proper demobilization of all restoration activities. • Initiate a post-emergency review to identify lessons learned via hot washes and after-action review meetings. • Ensure all documentation is submitted or stored appropriately and provide additional information as requested to aid in the development of the AAR for the event. • Ensure the development of an AAR when • necessary and the implementation of resulting lessons learned.
West & East Division Branch Director	<ul style="list-style-type: none"> • Ensure the staffing rosters for the Branch Director's staff positions are up to date and ready to be used for their respective EOC. • Brief their respective EOC and staff on the impending threat and level of response. • Initiate activities for appropriate resource acquisition and internal mobilization. 	<ul style="list-style-type: none"> • Notify the Operations Section Chief if additional operational resources are needed. • Ensure safety procedures and protocols are being followed. • Ensure crew movements are communicated with Planning and Logistics Sections. • Maintain an awareness of the number of customers affected. • Notify the Operations Section Chief when it is known the restoration crews are being ready to be demobilized and redeployed, if necessary. • Ensure adherence to the restoration priorities with all actions. 	<ul style="list-style-type: none"> • Ensure a proper demobilization of all restoration activities. • Initiate a post-emergency review to identify lessons learned via hot washes and after-action review meetings. • Ensure all documentation is submitted or stored appropriately and provide additional information as requested to aid in the development of the AAR for the event. • Ensure the development of an AAR when necessary and the implementation of resulting lessons learned.
T&D System Operations Branch Director	<ul style="list-style-type: none"> • Assess generation status. • Assess T&D System status. • Evaluate Black Start Procedures • Ensure all T&D redundant systems are in functional operating condition. • Prepare staffing plan, schedules, and briefing for control centers as dictated for the event classification and LEOC activation level. • Ensure equipment is set up for the T&D System Operations ICS organization. 	<ul style="list-style-type: none"> • Control what comes on or off the system from a Generation, substation, and line perspective. • Direct all operational requests and requirements to field personnel. • Isolate the grid as necessary during system constraints or lack of capacity • Provide field resourcing needs to planning and intelligence teams. • Provide IC and LEOC awareness of overall system capacity loading, issues, and priorities for the planning periods. • Provide restoration priorities from a system perspective to the OSC. • Provide ETRs as system conditions and status changes. 	<ul style="list-style-type: none"> • Ensure a proper demobilization of all restoration activities. • Initiate a post-emergency review to identify lessons learned via hot washes and after-action review meetings. • Ensure all documentation is submitted or stored appropriately and provide additional information as requested to aid in the development of the AAR for the event. • Ensure the development of an AAR when necessary and the implementation of resulting lessons learned.

Actions by Incident Command System Position

Operations Regional Commander	<ul style="list-style-type: none"> As directed, notify SERTs and other personnel of the impending threat and the level of response required. Prepare staffing plans and schedules for respective ROCCs as dictated for the duration level in the response matrix and approved by the Director. Ensures equipment is set up in respective ROCC and operational, shift schedules for all SERT resources are developed and the process is operating efficiently. 	<ul style="list-style-type: none"> Manages the overall readiness and operation of the assigned SERTs, including coordination. Responsible for ensuring that all communications and restoration processes are being implemented as consistent with the ERP. Ensures equipment is set up and operational, shift schedules for all SERT resources are developed, and the process is operating efficiently. Ensure adherence to the restoration priorities with all actions. 	<ul style="list-style-type: none"> Ensure a proper demobilization of all restoration activities. Initiate a post-emergency review to identify lessons learned via hot washes and after-action review meetings. Ensure all documentation is submitted or stored appropriately and provide additional information as requested to aid in the development of the AAR for the event. Ensure the development of an AAR when necessary and the implementation of resulting lessons learned.
Priority Restoration Group (PRG) Branch Director	<ul style="list-style-type: none"> Schedule crews according to predetermined shifts. Communicate with the OSC any staffing or restoration-related issues. 	<ul style="list-style-type: none"> Disseminate dispatch instructions to crews. Maintain communications with an assigned contact in the LEOC to address unique or emergency situations. Conduct close-out of OMS tickets with crews to receive reports on the nature of the work completed regardless of the manner of dispatch. Conduct follow-up phone calls and/or emails when work is completed including notification to the Customer Experience Team as needed, Community Affairs, and Regional and Municipal agencies. Ensure adherence to the restoration priorities with all actions. 	<ul style="list-style-type: none"> Participate in post-emergency reviews to identify lessons learned via hot washes and after-action review meetings. Ensure all documentation is submitted or stored appropriately and provide additional information as requested to aid in the development of the AAR for the event.
Planning and Intelligence Section Chief (PSC)	<ul style="list-style-type: none"> Participate in System-wide coordination conference calls and present any planning-related issues. Organize, assign, and brief your Planning team. Aid the IC in determining the necessary amounts and types of resources needed for the anticipated event (make formal resource requests to the LSC once approved by the IC) in accordance with the LUMA Major Outage Metrics, found in Appendix A. Communicate with the IC about any staffing or planning-related issues. 	<ul style="list-style-type: none"> Begin maintaining a detailed PSC activity log. Manage and administer the overall effort of collecting, processing, and reporting emergency service restoration information for the event. Compile, analyze and evaluate damage assessment and all other available trouble data to project an estimated number of resources, skills, and equipment required (and alter initial plans if required). Make additional requests for crew resources, materials, and other needs through the LSC. 	<ul style="list-style-type: none"> Ensure a proper demobilization of all planning restoration activities once notified. Participate in post-emergency reviews to identify lessons learned via hot washes and after-action review meetings. Ensure all documentation is submitted or stored appropriately and provide additional information as requested to aid in the development of the AAR for the event.

Actions by Incident Command System Position

Logistics
Section Chief
(LSC)

- Ensure outreach to contractors, local vendors, and property owners on the availability of resources.
 - Acquire outside resources including line, tree, damage assessment and support prior to a known event, as instructed by the IC, and ensure the information is sent to the Regional Logistics Team(s).
 - Ensure stockrooms and equipment are adequately stocked to respond and prepare and pre-stage critical materials, including storm kits when necessary.
 - Validate material stock levels against the damage predictive model and event classification
 - Establish contact with the Regional Logistics groups to ensure logistical processes and protocols are clear, and there is no redundancy of efforts. Ensure responsibilities and hand-off of information for each group are understood and schedule periodic conference calls.
- Receive and fulfill resource requests as received by the PSC (once approved by the IC) and ensure all responding resources have adequate lodging, meals, materials, and transportation, as needed.
 - Review current IAP for proposed tactics and track incident expansion/contraction due to restoration progress and changes in conditions.
 - Ensure that all personnel and equipment time records are complete and submitted to the Finance unit under the Administration Section at the end of each operational period.
- Upon notification by the IC ensure a proper demobilization of the Logistics unit and all logistical-related activities.
 - Consider demobilization early enough during the incident that an adequate demobilization plan is in place prior to the need to release resources (review resource list to ensure accuracy and timely release).
 - Participate in post-emergency reviews to identify lessons learned, via hot washes and after-action review meetings.
 - Ensure all documentation is submitted or stored appropriately and provide additional information as requested to aid in the development of the AAR for the event.

Finance/Admin
Section Chief
(FSC)

- Participate in System-wide coordination conference calls and present any Admin/Finance- related issues.
 - Coordinate procurement card increases and purchase orders prior to a known event and ensure the release of financial policies and work order numbers for use.
 - Coordinate with the LEOC on any facility needs and ensure the delivery and setup of any special equipment or generators as needed.
- Ensure that all storm-assigned personnel available are mobilized, and the Finance/Admin Section is staffed as appropriate.
 - Ensure that all personnel and equipment time records are complete and submitted to the Finance Section at the end of each operational period.
 - Ensure that all documentation for FEMA Cost Recovery is being completed.
 - Oversee the receiving and coordination of all claims-related issues regarding the event.
 - Working closely with Logistics, oversee event costs and estimate the total cost of the event prior to completion of the restoration efforts.
- When appropriate, ensure an orderly demobilization of the Admin/Finance Section and related activities.
 - Participate in post-emergency reviews to identify lessons learned, via hot washes and after-action review meetings.
 - Ensure all documentation is submitted or stored appropriately for FEMA Cost Recovery purposes and provide additional information as requested to aid in the development of the AAR for the event.

Actions by Incident Command System Position

Public Information Officer (PIO)	<ul style="list-style-type: none"> As needed, oversee the issuance of a Company statement concerning the activation of the LEOC and the necessity to release employees so that they can perform their emergency positions. Oversee proactive communications. 	<ul style="list-style-type: none"> Responsible for maintaining the unity of message before, during and after an emergency event to: employees, customers, and media outlets. Responsible for overseeing the collection, development, and dissemination of employee, customer, and public messages and communications. Coordinates with the EOCs to ensure consistent and accurate messaging for all emergency events. Ensure all news releases are reviewed and approved by the IC. Develop accurate and timely information for use during press/media briefings. Develop daily messages and provide them to the Planning Section Chief for inclusion in the IAP. Monitor and forward media information that may be useful to the Planning Section. 	<ul style="list-style-type: none"> When appropriate, ensure an orderly demobilization of the PIO support staff and related activities. Participate in post-emergency reviews to identify lessons learned via hot washes and after-action review meetings. Ensure all documentation is submitted or stored appropriately and provide additional information as requested to aid in the development of the AAR for the event.
Liaison Officer (LNO)	<ul style="list-style-type: none"> Implement pre-event notifications to key stakeholders, including emergency planning officials, municipal officials, local government and non-government organizations, and others, as required, in coordination with the PIO. Disseminate information to the Liaison organization. Ensure all required tools and technology are operating and available for use. 	<ul style="list-style-type: none"> Notify and activate required Liaison support staff. Ensure Liaisons are briefed on incident conditions and provide overall direction regarding messaging for key stakeholders. Inform the IC and General Staff of areas of concern and opportunities for coordination. Deployment of LUMA liaison to serve in local municipal EOCs and ensure notifications are made to key stakeholders, including emergency management officials, municipal officials, local government and non-government organizations, and others, as required, in coordination with the PIO. 	<ul style="list-style-type: none"> When appropriate, ensure an orderly demobilization of the LNO support staff and related activities. Participate in post-emergency reviews to identify lessons learned, via hot washes and after-action review meetings. Ensure all documentation is submitted or stored appropriately and provide additional information as requested to aid in the development of the AAR for the event.

Actions by Incident Command System Position			
Safety Officer (SOFR)	<ul style="list-style-type: none">• Ensure the staffing rosters for the Safety Officer's staff positions are up to date and ready to be used.• Participate in pre-event planning and operational conference calls and meetings.• Determine staffing needs based on the predicted or actual.• Event Classification Type or Event Level predictions.• Deploy Safety staff to various field locations as needed.	<ul style="list-style-type: none">• Provide regular reports and updates to IC.• Assign Safety staff as needed and ensure staffing level continues to be sufficient.• Ensure safety briefings are completed per the IAP for all personnel.• Notify IC about any safety-related incidents.• Develop safety messages to be used during an event.• Facilitate Site Safety Inspections as appropriate.• Reiterate responsibility to all LUMA employees to stop unsafe acts if observed.• Ensure prompt investigation and documentation following a safety incident.• Record safety incidents and include them in a safety report per LUMA Health Safety Environment & Quality (HSE&Q) standard in accordance with the LUMA Major Outage Metrics found in Appendix A.	<ul style="list-style-type: none">• When appropriate, ensure an orderly demobilization of safety-related activities.• Participate in post-emergency reviews to identify lessons learned via hot washes and after-action review meetings.• Ensure all documentation is submitted or stored appropriately and provide additional information as requested to aid in the development of the AAR for the event.

Table 1: LEOC actions by position

6 Restoration Strategy

6.1 Overview

The restoration strategy begins with the prioritized outages identified by the damage assessment teams and the Outage Management System (OMS). The restoration strategy takes into consideration outage information and identifies and compares that data to restoration protocols. System Emergency Restoration Teams (SERTs) must address emergency and life-threatening conditions such as public safety hazards or downed wires reported by first responders before any restorations begin.

Listed below and shown in Figure 1 is the prioritization of restoring power.



Figure 1: Prioritization of restoring power

1. Restore critical power assets – generation, micro grids, and mini-grids.
2. Repair key transmission lines – these lines transmit energy from generating stations to key substations.
3. Restore substations – energy can be distributed to the distribution network throughout communities.
4. Restore Community Lifelines – Hospitals, emergency shelters, water Systems, critical communication towers, ports, fire and police stations, and others (see Figure 2).

5. Restore large service areas – return service to the largest number of customers in the least amount of time. Services lines to neighborhoods, industries and businesses are restored systematically.
6. Restore individual homes.

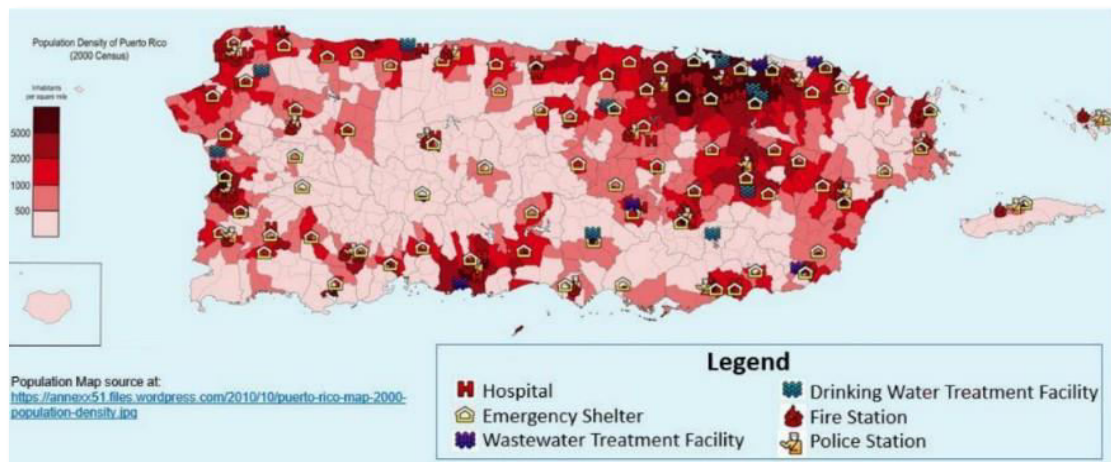


Figure 2: Map of Community Lifeline-related facilities

6.2 Mitigation Strategy

LUMA understands the importance of pre-planning, and its correlation to a timely and effective restoration response. LUMA undertakes a variety of initiatives to prepare its employees, infrastructure, emergency response partners, and the communities it serves. These initiatives include community awareness, training programs, employee training, drills, exercises, and system hardening projects in accordance with the LUMA Major Outage Metrics in Appendix A. These pre-storm actions assist LUMA in responding to outages more effectively, while ensuring that customers, employees, and key stakeholder groups are better informed and prepared when disasters strike.

6.2.1 Community Outreach

LUMA's storm preparation initiatives focus on educating the community it serves on the importance of preparedness and safety. Public education is vital to an efficient and safe restoration effort, and LUMA strives to inform its customers of what to expect before, during, and after large-scale events. Information is shared with the public through multimedia platforms such as LUMA's website, videos, social media, and its participation in community seminars, briefings, and exercises. LUMA believes that customer education is a year-round process.

6.2.2 First Responders

First Responders play an important role in an emergency or large-scale outage. These organizations aid in responding to and protecting the public from unsafe conditions such as downed powerlines or vehicle collisions. LUMA continues to build a partnership regarding preparedness and planning initiatives and supports them when an event occurs.

6.2.3 Governmental Organizations

Governments are defined as including government officials, local, city, and state emergency management organizations. LUMA continues to strengthen relationships with these critical stakeholders through information sharing and collaboration throughout the year.

LUMA practices its emergency preparedness and response plan through tabletop exercises and other relevant events. Companywide exercises center on planning and response activities during a large-scale restoration event and promotes open communication and collaboration between all affected and participating entities.

This alignment helps to ensure a clear and coordinated response when an emergency occurs and promotes dialogue and continuous improvement between organizations.

7 Concept of Operations

In the event of a major outage, LUMA responds and rapidly assesses the impacts on the T&D infrastructure and takes the necessary actions to mitigate cascading effects from a long-term power outage and restore service, minimizing the impact on the citizens of Puerto Rico.

7.1 Restoration Operations

Restoration Operations conducted in response to an event impacting LUMA's electric system is the responsibility of the Planning and Dispatch Team. The directives from the LEOC follow the LUMA Restoration Strategy identified in Section 6.

7.1.1 Approach

During emergencies, the Operations Section is responsible for safely and efficiently assessing the damage to the T&D infrastructure and restoring electric service. To accomplish this strategy, the East and West Branch Directors report to the Operations Section Chief within in the LEOC.

The ICS is flexible depending on the level of decentralization for the event. Under the direction of the East or West Branch Director the field teams respond to the event as efficiently as possible.

- The System Emergency Restoration Teams (SERTs) are responsible for the general restoration, vegetation clearing (tree removal) and repairs to the system.
- The Site Safety Branch is responsible for facilitating the response to downed wires (making safe or guarding the site from the public) and other immediate Health, Safety and Environment situations.
- Priority Restoration Group (PRG) is responsible for the priority restoration of critical facilities. The PRG operates in a centralized or decentralized environment as required.
- The Damage Assessment Teams are responsible for conducting and reporting on damage assessments.
- Dispatch supports all emergency response and restoration requests for field teams and EOCs.

The transition from response operations to restoration operations will be considered the point in time when 1) field personnel is able to be dispatched without unacceptable safety risks from continued dangerous conditions (where adverse weather conditions are applicable) and 2) when the potential additional damage to the electric system would be low in proportion to the expected level of damage already sustained. The start of the restoration period may be different for specific, local areas where the effect of an emergency limits access to facilities (e.g., severe flooding).

In any emergency, three vital pieces of information must be gathered to enable an effective restoration:

- Number of electric customers out of service.
- Amount of damage to the T&D System.
- Manpower available (along with the timing of availability) to repair the damage.

Following an outage and activation of the ERP, restoration of electrical services is conducted following four basic steps:

- **Make Safe**

When in a damaged state, T&D infrastructure presents an extreme risk to the public. Safety Teams rapidly respond to protect and correct any identified situation.

- **Damage Assessment (Rapid Survey and Detailed Assessment)**

Damage predictions assist with estimations of the time needed to assess and complete restorations.

- **Prioritization of restoration**

SERT priorities are identified and sorted by highest customer count. PRG priorities continue to be sorted by municipality identified Level 2 Critical Facilities and Level 3 Critical Facilities priorities within the Restoration Priority Matrix.

- **Execution of tactical restoration operations**

LUMA continually supports the “Safety Always” objective. Specific tactical objectives include fire/public-safety priority assistance, timely restoration, and providing useful, timely and accurate information to all stakeholders.

To facilitate expedient restoration and to maximize the optimal use of the workforce by focusing on making immediate, temporary repairs to restore power and postponing time-consuming permanent repairs until after the ERP activation is concluded and power has been restored.

A variety of factors and circumstances are considered when assigning work and may include, but are not limited to, the following

The type and availability of necessary resources to complete the repair.

- The proximity of available resources.
- The specific needs of the response.
- The type and/or the number of customers affected by the repair, and the time necessary to complete each specific restoration.

7.1.2 Mobilization of Personnel

When an impending threat is known with reasonable certainty, precautionary deployment of personnel can facilitate a rapid response. The most critical component is the ability to be flexible in order to expand and retract to optimum levels as the threat becomes more certain. An anticipated and planned impending major outage requires an appropriate mobilization of personnel to respond to and recover from an emergency event in an efficient and timely manner.

The IC has overall responsibility for notifying the Command Staff. The IC may activate other roles as necessary to serve the response based on incident developments and the Event Classification. These determinations affect the level of mobilization of personnel based on the estimated impact of the emergency event.

Upon notification, the Command and General Staff subsequently notify and mobilize the personnel from their respective sections and direct them to initiate their emergency restoration callouts.

In accordance with the LUMA Major Outage Metrics in Appendix A, Table 2 identifies LUMA's mobilization timeline.

Mobilization of Personnel	
Time After Damage Prediction	Percentage of Crews Deployed
Within 24 hours	50%
Within 48 hours	80%

Table 2: Mobilization of personnel

7.1.3 LUMA Resources

The Operations Section Chief makes a notification to the T&D Operations Branch Director. The T&D Operations Branch Director has responsibility for making notifications to the T&D Operations Branch staff in their respective geographic region or SERT boundary.

Regional Operational Managers are responsible for notifications to, and mobilization of, division personnel required for operational emergency response, proportionate to the size, scale, and complexity of the emergency. Subsequently, these elements notify and mobilize personnel from their respective branches, regions, and SERT teams, and direct them to initiate their emergency restoration activation protocol. Requested resources report to their designated staging area(s) or dispatched response locations. Various crews may include:

- Troubleman Triage (One-Person Crews)
- Troubleman Overhead Line Crews (Two Person Crews)
- Troubleman Underground Crews (Two Person Crews)
- Powerline Construction Crew
- Damage Assessment Teams
- Wire Watcher Teams
- Substation Workers/Techs
- Telecom Workers
- Transmission Line Workers
- Equipment Operators

7.1.4 On-Island Contingency Contract Crews

The activation and assignment of crews are vital parts of the restoration process. LUMA may activate contingency contract manpower, or contracts that have been pre-negotiated in accordance with LUMA and FEMA procurement policy. These contract crews support the restoration of the T&D System by increasing the capacity of the organization which is dependent on the severity of the emergency event and may include any of the following:

- Troubleman Triage (One-Person Crews)
- Troubleman Overhead Line Crews (Two Person Crews)
- Troubleman Underground Crews (Two Person Crews)
- Underground Splicing Crews
- Powerline Construction Crew
- Tree Crews

- Damage Assessment Teams
- Wire Watcher Teams
- Substation Workers/Techs
- Telecom Workers
- Transmission Line Workers
- Equipment Operators

The T&D Electric Operations West and East Divisions are routinely engaged on a continual basis in the type of work necessary to restore electric service. Traditional lines of communication exist between these divisions that facilitate the coordination of the day-to-day contractor work forces in all conditions of readiness to the degree necessary.

7.1.5 Mutual Aid and Off-island Support

Mutual aid assistance is an essential part of the electric power industry's service restoration process and contingency planning on the island of Puerto Rico where utility-qualified resources are limited. As an operating utility in Puerto Rico, LUMA is an active member in mutual aid agreements and has contingency contracts in place which enable LUMA to access mainland utility resources more efficiently.

7.1.6 National Guard Assistance

The National Guard Support Program provides power restoration support from National Guard personnel when a catastrophic event occurs, and the customary sources of supplemental personnel, such as mutual assistance, contractors, or internal staff cannot provide adequate personnel to address needs. In order for the National Guard to be available for deployment, the Governor of Puerto Rico must declare a "State of Emergency." As warranted and available, the Incident Commander may initiate actions to secure additional support available through the National Guard.

The National Guard is frequently called on to conduct disaster response and domestic emergency missions. These missions are a specific subset of the National Guard Civil Support (NGCS) mission area. Puerto Rico National Guard forces can provide surge logistics, transportation, communication assistance, and general-purpose capability to areas identified by the Puerto Rico Emergency Management Bureau to supplement LUMA emergency response by expediting power restoration during the initial response to an incident. If National Guard Domestic Operations (NGDO) resources are deemed necessary, the following is a summary of roles that they could fulfill:

- Public Safety
 - Wire guarding for down wires
 - Flagging for traffic control
- Logistics Support
 - Points of Distribution – including transportation and distribution of ice or water to teams
 - Fueling – delivery of fuel to vehicles and equipment engaged in power restoration work
 - Lighting – delivery and operation of portable light towers to support restoration crews (they can operate, transport, and refuel any light towers provided to them by the company, Mutual Assistance Crews, contractors, or equipment rental companies)

- Emergency Transportation
 - Short-haul transport of cargo or materials from staging areas to point-of-repair locations
 - High-axle transport of Damage Assessment Teams or Restoration Crews
 - Aerial assessments (only as “lift of opportunity,” when combined with an existing National Guard mission); should National Guard assets be utilized for aerial patrols, National Guard pilots are required to attend LUMA’s training to ensure compliance with internal safety requirements
- Heavy Equipment
 - Supply dozers and backhoes for clearing rights-of-way of debris, building road access to powerlines in a remote area
 - Specialize equipment to access mountainous areas
- Security
 - Provide temporary security for job sites, critical substations, and laydown yard
- Communications Support
 - Provide assistance, with temporary communications in critical areas to assist with high priority restoration operations

7.1.7 Damage Assessment

A Damage Assessment (DA) is a key component of restoration operations. The damage assessment process utilizes “two-person” teams, or additional support as needed, to physically inspect and report overhead primary and secondary damage locations associated with each locked-out circuit. Assessment personnel is managed through the Regional SERT and provide their report to the Regional Commander. The order of evaluation is based on the restoration priority list. Post-event, the T&D System Control Center monitors and develops an initial system status report. This report is used to compare the current level of electric demand on the system to the forecasted demand.

The DA report is disseminated to the Operations Section in the LEOC where resources and equipment requirements to make the repairs and restore services are identified. Additional information on specific Damage Assessment protocols is in development.

7.1.8 Major Outage Event Preliminary DA

LUMA begins a preliminary DA of the affected area(s) and/or T&D facilities when it is safe to do so. The preliminary DA is completed within a reasonable time (see Table 3) at the beginning of the Operation Response phase in accordance with the LUMA Major Outage Metrics in Appendix A. Reasonable times are determined by the start of the operational response (after the event has passed and when it is physically safe to dispatch crews) to when less than ten thousand (<10,000) T&D Customers are affected. The preliminary damage assessment is performed primarily by the helicopter patrol with targeted land patrols when additional information is needed.

Preliminary DA Reasonable Time		
Event Type	Duration of Event	Response Time
Type 3 or 2 – High Alert or Emergency Conditions	3 to 5 days	36 hours
Type 2 – Emergency Conditions	5 to 10 days	72 hours
Type 1 – Catastrophic	Greater than 10 days	120 hours

Table 3: Reasonable time for preliminary damage assessment

7.1.9 Restoration

LUMA utilize processes to safely and efficiently repair damage and restore electrical service. These restoration protocols are designed to restore power to the largest number of customers, in the shortest amount of time and in the safest way possible.

Field damage assessments and repairs may commence when:

- Field personnel can be deployed without unacceptable safety risks from continued dangerous conditions.
- The potential of additional damage to the electric system is low.

7.1.10 Prioritization

Outages are prioritized by considerations of safety conditions, type and number of damages to the system, critical community lifelines, customer type, and the number of affected customers. LUMA focuses restoration efforts to restore service to critical facilities, such as hospitals, police departments, fire departments, and other public health and safety facilities on a priority basis, as warranted. LUMA must make prudent decisions that have the greatest gain for the overall T&D System stability and the greatest benefit for all customers.

Priority restoration cannot be guaranteed. Therefore, LUMA implements specific communication outreach programs to critical facilities, municipal governments, and key account customers to alert them to properly prepare for potential prolonged power outages, and to provide information and updates on LUMA's preparation and restoration activities.

LUMA must address emergency and life-threatening conditions (public safety hazards, downed wires reported by emergency responders) before restoration efforts can commence.

7.1.11 Situational Assessment

LUMA completes a high-level system assessment through the System Operations Center's Supervisory Control and Data Acquisition (SCADA), OMS and reported outages from LUMA customers. When an Event Classification Type has been determined, personnel are assigned per the LUMA incident command structure.

All activities are assigned, assessments are documented, repairs are performed, and service is restored in accordance with the following set of general priorities:

- **Eliminate Unsafe Conditions:** the elimination of hazards to the public takes precedence during emergencies. Safety Crew personnel are activated and required to:
 - Respond to reports of downed wires.
 - Cut, clear, and/or repair the primary and secondary hazards.
 - Clear wires so that service may be restored up to the location of the break.
 - Prioritize response to emergency calls based on the severity of risk for areas.
 - Additionally, at the initial stages of the restoration process, LUMA may be directly assigned to municipalities to "make safe" downed wires to remove trees and other debris from major roadways.
- **Transmission Circuits and Substations:** restoration is prioritized by the T&D System Operations Branch Director.
 - Determines the need for the bulk electrical system.
 - Damage assessment and repair of transmission lines and key substations.
 - Request personnel to support the restoration of transmission service to substations.
 - Bulk distribution feeder circuits, not directly affecting substations, are assigned a priority, depending on the importance of the circuit and the effect of its loss on the bulk electrical system.

- Substation repairs are directed by the East or West Division Branch Director of the affected area in consultation with the T&D System Operations Branch Director.
- Primary Distribution Circuits and key feeder portions of 'locked- out' 3-Phase primary distribution circuits are restored by either cutting faulted sections clear or by opening sectionalizing devices (i.e., switches). Damages are repaired, restoring all 3- Phase primary distribution circuits.
- Secondary Distribution Lines and Services Areas where there is only damage to secondary distribution lines and services are restored simultaneously. Repair crews perform a final assessment of damage in the area and repair any additional damage found.
- Permanent Repairs - after all electric service has been restored, permanent repairs are made to any remaining temporary field conditions. During the restoration of service, if practical, permanent repairs are made to avoid hazardous conditions and eliminate duplication of effort.

7.2 LUMA Event Classification Type

All potential events, natural, man-made, and technological, with the potential to affect LUMA Operations are assigned a classification by the Incident Commander or designee. The IC is responsible for analyzing the severity and complexity of the incident, with the collaboration and input of the Command and General Staff. This analysis assists in identifying resource requirements and positions needed for a LEOC activation at all levels of the ERO. This analysis typically begins in the pre-event stage and continues every operational period throughout the service restoration stage for restoration events.

It is during this analysis that the IC determines the Event Classification Type in accordance with the ERP – Appendix A. These classification types are not directly tied to the establishment of LEOC activation levels, described in the ERP – Appendix A. As such, an event classification of Type 1 does not always result in the establishment of a LEOC Activation Level 1, and vice versa.

The IC may also deem it necessary to escalate or de-escalate the Event Classification Type and LEOC Activation Level depending on changes in circumstances or where actual conditions differ from expected conditions. The Event Classification Type depends upon the analysis of the expected severity and complexity of an event and is drawn from the consideration of numerous factors.

Five (5) event types have been established. Types Five (5) and Four (4) are considered Non-Emergency Events and are restoration events managed as normal operations and/or an isolated event that does not necessitate the activation of the LEOC unless escalation occurs.

Types One (1), Two (2), and Three (3) are Emergency Events, with Type Three (3) being the less severe and Type One (1) representing catastrophic emergency conditions. LUMA's Emergency Event Types (1-5) as they relate to Major Outage Events in detail are described in detail in Tables 4-8. This is used in conjunction with the general conditions described in the ERP – Appendix A.

Type	Anticipated LUMA Operating Conditions	
Type 1 – Catastrophic Emergency	Viewpoint	<p>A type 1 event is a catastrophic event, which historically results in significant damage to the electrical transmission and distribution system. Type 1 events are rare but are typically predicted before the event. This event requires the full implementation of ICS, and all employees are assigned shifts and scheduled in relation to their role in the ERP. All branch divisions and ROCCs are activated. This type of event is coordinated through daily Incident Command meetings/conference calls to coordinate pre-event planning activities, restoration activities during the event, and post-event demobilization activities.</p> <p>Communication protocols are activated and discussion with local and Government of Puerto Rico officials occurs before the impact and through the restoration stage.</p>
	Characteristics	<ul style="list-style-type: none"> • The severity of the damage affects the entire system in such a way that restoration activities may require ten (10) days or more once it is safe to begin restoration activities. • Typically, > 50% (>700,000) customer outages at peak • Typically, > 50,000 outage event at the peak • This type of event is expected to occur between 1 and 4 times over a ten-year period.
	Response Organization	<ul style="list-style-type: none"> • System-wide incident command structure is enabled • All Command and General Staff posts are activated • The LEOC and many/all ROCCs are operational • Additional catering support functions will be established at the branch and/or ROCC level as directed by the PSC and OSC and approved by the CI. • Remote Restoration Management Teams are activated in the most severely impacted areas at the discretion of the Chief of the Operations and Planning Section and are approved by the Incident Commander. • Liaisons are activated • Staging Areas may be required to support external teams and resources.
	Resource Activation	<ul style="list-style-type: none"> • This response requires external assistance from contractors and/or mutual assistance from other utilities outside the region • The system's emergency restoration teams are activated in the most severely affected areas at the discretion of the chief of the Operations and Planning Section and are approved by the Incident Commander. • The PREMB EOC liaison officer can be activated depending on the level of State Coordination required. • LUMA will likely require a large increase in various staff and equipment positions • Additional staff will be provided to support the restoration.
	Communication Coordination	<ul style="list-style-type: none"> • Federal resources coordination likely to be required • A written Incident Action Plan (IAP) is required for each operational period • Pre-event reporting required • Pre-event outreach to municipalities, elected officials and regulators • Restoration phase reporting required • An After-Action Review is required • Post-event meetings will be held with the most severely affected communities

Table 4: Type 1 - Catastrophic Event characteristics

Type	Anticipated LUMA Operating Conditions	
Type 2 – Emergency Conditions Event	Viewpoint	A type 2 event is a serious event that has historically resulted in significant damage to the electrical transmission and distribution system in a region(s) or could be moderate damage throughout the territory. Type 2 events are usually predicted in advance. This is a complete ICS implementation, and most employees are assigned shifts and scheduled to be related to their role in ERP. This type of event is coordinated through daily Incident Command meetings/conference calls to coordinate pre-event planning activities, restoration activities during the event, and post- event demobilization activities. All affected branches, divisional and regional Emergency Operations Centers (EOC) are activated. Communication protocols are activated and conversations with local and Government of Puerto Rico officials are extended before the impact and through the restoration phase.
	Characteristics	<ul style="list-style-type: none"> • The severity of the damage within a specific region or spreads through the system is such that restoration activities are usually carried out within a 7-day period once it is safe to begin restoration activities • Typically, 25% to 50% (350,000 to 700,000) customer outages at peak • Typically, >25,000 outage events at the peak • This type of event is expected to occur between 2 and 4 times over a five-year period.
	Response Organization	<ul style="list-style-type: none"> • The system-wide incident command structure is activated • All command and general staff posts are activated • The LEOC and many/all ROCCs are operational • Additional restoration support functions will be established at the branch and divisional level of the Equal Opportunities Commission, as instructed by the heads of the Planning and Operations Section and approved by the incident commander. • The system's emergency restoration teams are activated in the most severely affected areas at the discretion of the chief of the Operations and Planning Section and are approved by the Incident Commander. • The PREMB EOC liaison officer can be activated depending on the level of state coordination required. • Community liaisons are activated to the EOC to serve the communities as instructed by the liaison officer and approved by the incident commander • Rehearsal areas may be needed to support crews and external resources
	Resource Activation	<ul style="list-style-type: none"> • This response requires external assistance from contractors and/or mutual assistance from other utilities outside the region • LUMA Energy will likely require a large increase in several staffing and equipment positions • Additional staff will be provided to support the restoration
	Communication Coordination	<ul style="list-style-type: none"> • Federal resources coordination likely to be required • A written IAP is required for each operational period • Pre-event reporting is required. • Pre-event outreach to municipalities, elected officials, and regulators • Restoration phase reporting required • Post-action review required • Post-event meetings can be held with the most severely affected communities

Table 5: Type 2 - Emergency Conditions Event characteristics

Type	Anticipated LUMA Operating Conditions	
Type 3 – High Alert Event (Moderate Regional Event)	Viewpoint	A Type 3 event represents the largest range of uncertainty due to the severity of the event being forecast (Tropical Depression/Storm) but with low to medium confidence levels for the degree of impact and geographic area that is threatened. This type of event historically resulted in significant damage to the districts or moderate damage to the region(s). The approach is to prepare so that several regions will potentially be affected by the activation of the ICS structure and the opening of one or more EOC. Employees will be assigned shifts and scheduled according to the threat, then moved to the areas with the least impact to the areas that received the most damage. This type of event is coordinated through daily Incident Command meetings/conference calls to coordinate pre-event planning activities, restoration activities during the event, and post- event demobilization activities. Communication protocols are activated and conversations with local and state officials are extended before impact and through the restoration phase.
	Characteristics	<ul style="list-style-type: none"> • The severity of the damage within a specific district or region or region is such that restoration activities are usually carried out within a period of 48-72 hours. • Typically, 10% to 25% (70,000 to 350,000) customer outages at peak • Typically, >10,000 outage events at the peak • This type of event usually occurs between 1 and 5 times a year
	Response Organization	<ul style="list-style-type: none"> • The incident command structure is activated at the EOC level of the system up to the local level • One or more of the EOC can be triggered to match the complexity of the event • Additional restoration support functions, such as decentralized dispatch, downed cables and damage assessment, may be established in a branch and/or division, as instructed by the heads of the Planning and/or Operations Section and approved by the Incident Commander. • Community liaisons are activated to operational EOC as instructed by the liaison officer and approved by the incident commander • The PREMB EOC liaison officer can be activated depending on the level of state coordination required. • Waiting areas may be needed in an area if it has been severely affected and requires a concentrated number of crews and resources.
	Resource Activation	<ul style="list-style-type: none"> • This response may require external assistance from contractors and/or mutual assistance from other utilities outside the region • LUMA Energy may require a large increase in various personnel and equipment positions • Additional staff can be obtained from restoration support functions.
	Communication Coordination	<ul style="list-style-type: none"> • A written IAP may be required for each operational period • Pre-event reporting required • Pre-event outreach to life support clients, municipalities, elected officials and regulators is carried out as needed • Restoration phase reporting required

Table 6: High Alert Event characteristics

Type	Anticipated LUMA Operating Conditions	
Type 4 – Non-Emergency Restoration Event (Heightened Alert)	Viewpoint	Type 4 events include (but are not limited to): system events that impact one or more districts. Type 4 events may be due to thunderstorms, high winds, frequent and/or severe lightning, small to moderate winter storms or unanticipated events. Typically, these events are managed by System Operations with assistance from Field Operations. Control and management of the event typically remains centralized but may decentralize to one or more Emergency Operations Centers depending on the damage. The Incident Command Staff is notified, and specific sections may be activated depending on the impact of the event.
	Characteristics	<ul style="list-style-type: none"> • The damage severity within a specific district is such that restoration activities are generally accomplished within a 12-24-hour period • The incident is usually limited to one or two operational periods in the Event Restoration phase. • Typically, 1 to 5% (14,000 to 70,000) customer interruptions at peak • Typically, >7,000 Outage Events at peak • This type of event generally occurs less than 5 to 10 times per year.
	Response Organization	<ul style="list-style-type: none"> • Incident Command Structure may be activated • Command and General Staff positions activated as needed • One or more ROCCs may be operational depending on the geographical threat and complexity • Community Liaisons may be staffed at the activated EOCs as directed by the Liaison Officer and approved by the Incident Commander.
	Resource Activation	<ul style="list-style-type: none"> • Internal restore resources normally available • Restoration is generally accomplished with local assets possibly with the help of other assets in the regional distribution line • Typically, 2-50 personnel may be deployed to the LEOC or ROCCs that have been activated at the discretion of the Planning and/or Operations Section Chiefs and approved by the Incident Commander to perform other functions.
	Communication Coordination	<ul style="list-style-type: none"> • No written IAP required • The operations and maintenance department may hold regional briefings or conference calls to ensure that the complexity of the event is fully communicated to management and that response personnel receive the appropriate level of support required for the event.

Table 7: Non-Emergency Restoration Event characteristics

Type	Anticipated LUMA Operating Conditions	
Type 5 – Normal Operations	Viewpoint	Type 5 events represent normal operations and are managed by the System Operations Dispatch Organization, which is staffed 7 hours a day on 24/365. For small outages, system operations will send designated problem resources to repair the outage. If upon arrival it is determined that additional resources are needed, a supervisor is assigned and additional line crews from the field operations organization will be secured.
	Characteristics	<ul style="list-style-type: none"> • System activity is normal • Incidents are contained within the first operational period and last less than 12 hours after resources arrive on the scene • Typically, <1% (14,000) peak client outages • Typically, <2,500 outage events at the peak • Normal daily internal team assignments
	Response Organization	<ul style="list-style-type: none"> • Incident command structure is not activated • Emergency Operations Centers are not activated
	Resource Activation	<ul style="list-style-type: none"> • Response to outages is coordinated with local on-call staff
	Communication Coordination	<ul style="list-style-type: none"> • No written IAP is required

Table 8: Normal Operations characteristics

Table Notes:

- Type 1, 2, and 3 events are “Emergency Events”. Types 4 and 5 are restoration events managed as normal operations unless escalation occurs.
- The expected percentage of customers without service is based on the peak during the event period.
- “Outage Events” equates to outage events tracked and entered in the OMS. Some reported damage to the electrical infrastructure that requires repair may not cause an outage but may need to be addressed such as a low wire, tree limb on a conductor or damaged equipment.
- For all Event Classification Types, evaluation and estimations of needed crews and resources are a result of several factors, including but not limited to:
 - The anticipated circumstances of the emergency condition(s).
 - The anticipated geographic impact of the emergency condition(s).
 - The level of availability of external or mutual aid resources.
 - Travel distance or other logistical considerations that increase or diminish the ability of external or mutual aid resources to assist effectively in the restoration effort.

7.3 Restoration Priority Matrix Guidelines

LUMA strives to restore power to all customers in the safest timely manner possible. In support, LUMA Operations utilize a Restoration Priority Matrix during both normal and emergency operations, which provides the most efficient approach to restoring electrical outages.

All outages are prioritized using a variety of factors including, but not limited to the following:

- critical community lifelines
- customer type
- number of affected customers
- outages involving safety conditions
- make safe protocols

7.3.1 Downed Wires

The safety of the public is a primary concern of LUMA, and the elimination of hazards takes precedence. The objectives of LUMA's Downed Wire Protocols include heightened tracking of downed wire incidents, accurate reporting of the response time to downed wire locations, and full documentation of the actions taken.

Response requires trained and qualified personnel to investigate reports of downed wires and conduct repairs. Incidents are created within the OMS system with one of the following conditions identified:

- downed wires - pole-to-pole or downed wires - pole-to-building
- downed wires and burning
- sparking wires

Response to downed wires for performing the initial investigation and clearing the hazard is under the direction of the Operations Section. The Damage Assessment Teams assist Operations with the prioritization and identification of teams for assignment.

Dispatchers determine the appropriate resources assigned to both evaluate and guard downed wires or make the incident safe and work with the Logistics Section regarding those resources.

When assigning and responding to downed wire reports, the LUMA Downed Wires Priority and Severity levels are utilized as a guideline (Tables 9 and 10). Non-outage emergency jobs during restoration activations include downed wires, burning/sparking wires, pole damage, and miscellaneous emergency calls.

Priority Level	Description of Downed Wires
1	Downed wire reports, where it is indicated that the wire is burning, arcing/sparking, or an immediate hazard, or energized primary or secondary downed wires in heavy pedestrian areas such as communities, schools, etc.
2	Non-service downed wire incidents where fire departments, police departments, or other municipal agencies are standing-by on the downed wire location or have been reported by municipal officials.

Priority Level	Description of Downed Wires
3*	Report of electric downed wire from an emergency organization: <ul style="list-style-type: none"> Reported to be affecting traffic flow on a major public highway Reported to be blocking/near a pedestrian walkway or driveway Reported to be the primary conductor Reported to be the secondary conductor
4	Report of electric downed wire from other sources: <ul style="list-style-type: none"> The primary conductor is indicated The secondary conductor is indicated
5	Report of downed wire where the type of wire is not indicated, and it appears the wire is not likely an electric conductor.
*Priority 3 includes reports from members of the 911 call center, police, fire, EOC personnel, and emergency managers.	

Table 9: Priority levels of downed wires

Damage assessment and/or repair personnel is then dispatched from the region or district area, through OMS, to assess and/or safeguard downed wire incidents, in priority order. Upon arrival at the location of a downed wire report, and initial assessment of the situation, the severity is determined. If necessary, the responder either:

- Makes the situation safe, so that the wire is not a risk to the general public in the area.
- Stands by at the location until relieved or until the situation is made safe by a qualified crew.

Notification of a downed wire by a 911 agency that involves a hazard, such as a fire or situation where individuals are trapped by a downed wire, results in the immediate dispatch of an Overhead Line Crew to the incident, when environmental conditions permit.

The remaining downed wire reports are then assigned to damage assessment and/or repair personnel, according to the downed wire priority, as referenced below (highest to lowest). Damage assessment and/or repair personnel that is specifically dispatched to safeguard downed wire situations will respond to the location of the downed wire. After assessing the situation, the severity is determined based on the following guidelines (highest to lowest).

Severity Level	Description of Downed Wires
1	Downed wire conductor that <i>poses a high risk to public safety</i> , due to its location on a road or pedestrian-accessible area. These situations require damage assessment and/or repair personnel to remain on-site and guard the wire until they can be relieved by a Wire Watcher or after a qualified employee or contractor has made the wire safe.
2	Downed wire is a <i>primary conductor</i> but is not on a main road or other easily accessible location. These situations also require damage assessment and/or repair personnel to remain on-site until relieved by a Wire Watcher or the conductor can be verified deenergized by a qualified employee or contractor. Once the wire is known to be de-energized, the damage assessment and/or repair personnel barricade or tape the area and then can move on to their next location.

Severity Level	Description of Downed Wires
3*	Downed wire is a <i>secondary conductor</i> . Damage assessment and/or repair personnel attempt to notify nearby customers and barricade/tape off the area to clearly distinguish the hazardous area. If the wire is either open wire secondary or triplex service cable that has an exposed end (wire is broken), damage assessment and/or repair personnel remains on-site until relieved by a Wire Watcher or a qualified employee or contractor has verified that the wire is not energized.
4	Downed wire is <i>not an electric conductor</i> and is <i>not in contact with an electrical conductor</i> , but is instead phone, cable, or other communications property. If the situation is safe, damage assessment and/or repair personnel inform their coordinator of this and move on to the next order. Their coordinator may then provide this information to the appropriate company or liaison for communication to the responsible company.

Table 10: Severity of downed wires

Once the joint reporting and response process is established, LUMA responds to all reported downed wires and take appropriate action within a reasonable time in accordance with the LUMA Major Outage Metrics found in Appendix A, (per the event categorization, see Table 11) while working in conjunction with local authorities after a Major Outage Event. The response time to downed wires is determined by the length of time estimated once environmental conditions allow for the same transportation of crews to the location of downed wires. The response time also indicates the estimated amount of time that passes when less than ten thousand (<10,000) T&D Customers remain interrupted. Table 11 aligns the event classification type to the expected duration of the response.

Downed Wire Reasonable Time		
Event Type	Duration of Event	Response Time
Type 3 or 2 – High Alert or Emergency Conditions	3 to 5 days	18 hours
Type 2 – Emergency Conditions	5 to 10 days	36 hours
Type 1 – Catastrophic	Greater than 10 days	60 hours

Table 11: Reasonable time for response to downed wires

7.3.2 Road Closure Priorities

LUMA recognizes the importance of clearing emergency evacuation routes and main thoroughfares and understands the key role they play in helping to make areas safe to clear by de-energizing and/or removing downed electrical wires that may be blocking roads or entangled in downed trees or roadway debris.

Once it is safe to commence the restoration process, LUMA often deploys trained personnel comprised of trained high voltage line workers that have the proper skill sets to cut clear, and/or de-energize/ground downed wires. By completing this process, transportation corridors become safely passable.

Where possible, a restoration crew makes the location safe. If required, a wire guard representative is dispatched to the location to await SERTs. Restoration priorities are identified within the Restoration Priority Matrix, Table 12.

Priority Level	Description of Downed Wires
1	Local and State roads and emergency service roads.
2	County roads and critical municipal identified locations.
3*	Report of electric downed wire from an emergency organization: <ul style="list-style-type: none"> Reported to be affecting traffic flow Reported to be blocking/near a pedestrian walkway or driveway
4	Report of road closure from other sources where a downed wire may be the cause or ancillary to the primary cause of the road closure.
5	Report of road closure where the type of wire is not indicated, and it appears the wire is not likely an electric conductor.

Table 12: Priority of road closures

7.3.3 Critical Facilities

Critical facilities identified as Level 1 facilities provide services that are critical to the health and safety of the public and are tied to at least one of the seven critical community lifelines.

LUMA also places additional emphasis on critical community lifeline facilities and other vital service locations. Critical facility customers, first responder organizations, and other vital sites, such as hospitals, evacuation centers, and water treatment plants are assigned the highest level of importance (as shown in Table 13).

Critical Facility Levels	
Critical Facility Level 1	<p>These facilities provide services critical to public health and safety (Critical Community Lifelines):</p> <ol style="list-style-type: none"> 1) Hospitals and Emergency Medical Facilities 2) Emergency Shelters and Cooling Centers and Rescue Facilities 3) Emergency Operations Centers (LUMA and Municipal) 4) Water pumping stations and wastewater treatment plants 5) Fire, Police, Paramedics 6) Critical Utility and Communications Facilities 7) Fuel Transfer and Fuel Loading Facilities (ports) 8) Mass Transit (tunnels, electric drawbridges, ferry terminals, major rail facilities/rectifier stations) 9) Airports 10) Military Bases 11) Critical Flood Control Structures
Critical Facility Level 2	<p>These facilities provide significant public services and may include some of the same types of facilities described in Level 1 depending on the event type, but are considered to some extent less critical by government agencies:</p> <ol style="list-style-type: none"> 1) Nursing Homes and Dialysis Centers 2) Facilities to support other critical government functions 3) Prisons and Correctional Facilities 4) Communications (radio, TV, etc.)

Critical Facility Levels	
Critical Facility Level 3	<p>These facilities provide some public services and may include some of the same types of facilities described in Level 2 depending on the event type, but are considered to some extent less critical by government agencies:</p> <ol style="list-style-type: none"> 1) Event Specific Concerns 2) High-Rise Residential Buildings 3) Customers providing key products and services (food warehouse) 4) Managed Accounts, Large Employers, and Other Key Customers 5) Other Government Buildings, Schools, and Colleges

Table 13: Critical facilities by level

7.3.4 Emergency Event Conditions

The Restoration Priority Matrix and Critical Facility Level protocols are consistent in both normal and emergency operations. If the event damage is so severe that all available resources are expended or damaged, LUMA's restoration efforts focus on the major prioritization objectives listed below until additional operational crews and other mutual aid arrives:

- 1) Responding with appropriate resources to address emergency and life-threatening conditions.
- 2) Clearing of downed wires to facilitate prompt clearing of public safety hazards and opening of critical transportation corridors.
- 3) Restoration of LUMA's Transmission Lines and Substation Facilities.
 - a) Focusing on restoring crucial Transmission Lines that allows for the strategic dispatch of energy from key generation assets to load centers.
 - b) Emphasis is placed on restoration of service to a LUMA's Transmission Lines feeding substations experiencing a "loss of supply".
- 4) Restoration of feeder breaker lockouts to restore large numbers of customers.
- 5) Restoration to Critical Community Lifelines.
 - a) Service is restored to critical facilities as quickly as possible. These circuits and locations are placed at the top of the restoration priority.
- 6) Communications with Customers and Stakeholders.
 - a) It is vital that early and accurate communication of system conditions be made known, and that continuous updating occurs as storm restoration activities continue.
- 7) Minimum Restoration Time.
 - a) Plans are formulated to complete restoration efforts on all interrupted customers, following a severe storm, as quickly as possible. Restoration efforts are prioritized in the following manner:
 - i) larger area outages
 - ii) smaller area outages
 - iii) individual house service

7.3.5 Make Safe Protocols

Clearing emergency evacuation routes and main transportation corridors may be an important part of the response to an emergency. Qualified electrical field crews play a significant role by de-energizing and/or removing downed electrical wires that may be blocking roads or entangled in downed trees or roadway debris.

During large-scale events, the number of internal resources that are trained and readily available is limited, and the demand could greatly exceed available resources. Based on needs and available resources, LUMA reassigns available internal resources and utilizes qualified external resources to ensure “make safe” actions are taken.

8 Estimated Time of Restoration Guidelines

Providing Estimated Time of Restoration (ETRs) is a top priority of LUMA’s overall restoration process in accordance with the Major Outage Metrics in Appendix A. LUMA aims to serve its customers, municipal officials, and emergency support organizations by providing ETRs in a timely manner.

The timing, magnitude, and impact of an event factors into ETR times, therefore LUMA establishes a baseline of projections to assist when determining operational goals and timelines. An ETR provides an estimate of when service is restored to a customer, location, and/or work assignment based on the on-site assessment and historical data. Specific priorities and tactical objectives are guided by the IC and General Staff based on available resources and response priorities. See Table 14 for the estimated time of restoration for 90% of service outages.

ETRs are a predictor of outage lengths which assist with determining the operational resources and actions required. Due to every event’s unique nature, subjective analysis as well as experience during similar events are required to estimate resource, material and equipment requirements based on weather or other known hazard conditions.

ETRs are segregated into four types: Global, Regional, Local, and Individual Customer. These classification levels allow LUMA to provide its customers with more accurate restoration estimates, based on the current and anticipated conditions as well as the corresponding restoration efforts. ETR information may be updated as additional data and information is obtained during restoration.

- Global ETRs – Information is determined at a system-wide level.
- Regional ETRs – Information is determined at a regional level.
- Local ETRs – Information is determined at a municipal level.
- Individual Customer ETRs – Information is determined at a customer level.

Figure 3 provides a high-level overview of the typical ETR process during restoration efforts and includes a summary of targeted efforts and information available during various stages of restoration.

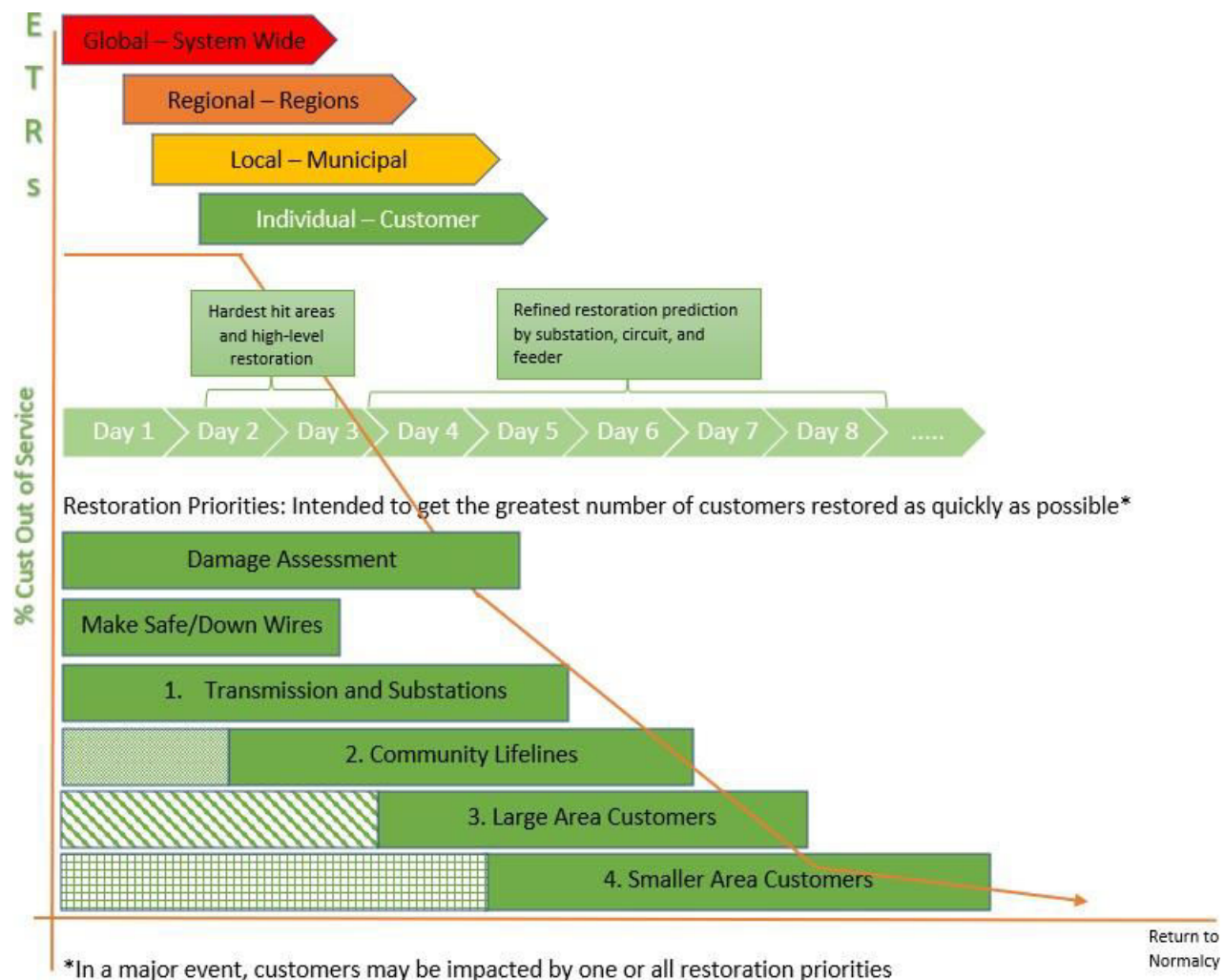


Figure 3: ETR definitions

The protocols are considered minimum requirements necessary to ensure all customers are adequately informed. During restoration, LUMA refines ETRs and will update customer representatives, Interactive Voice Response (IVR) systems, and web sites as the situation changes. LUMA provides restoration information (including customer outage counts and ETRs if available) to media outlets and public officials in affected areas during major outage events. Additionally, LUMA issues at least one press release daily for all major outage events with an expected restoration period longer than 48 hours. For widespread events, company-wide outage statistics may also be provided as part of the initial notification, if available.

Downed Wire Reasonable Time	
Time After Damage Prediction	Percentage of Service Restoration
24 hours	90%
All ETRs should be updated every 24 hours in accordance with the LUMA Major Outage Metrics in Appendix A.	

Table 14: Estimated time of restoration for 90% of service outages

During an emergency event, the ability to reach a representative for non-outage or non-emergency requests may be suspended temporarily, and the automated system may not be available for account information. ETR information is communicated through multimedia platforms and the IVR in accordance with the LUMA Major Outage Metrics in Appendix A. The anticipated actions related to the assessment and identification of ETRs are detailed in Tables 15 and 16.

Type 3 Events expected to last 48 hours or less

Within the first 6 hours of the restoration period
<ul style="list-style-type: none"> • Notify regulatory authorities of the expectation that the event will last less than 48 hours. The notification to regulatory authorities will state what LUMA has defined as the start of the restoration period. For events expected to last less than 24 hours, the notification may be via IVR. • Provide available information to the public via customer representatives, IVR systems, and web sites. • In certain situations (e.g., nighttime events), only limited information may be available within the initial six-hour window. In these situations, the expectation is that the companies will inform Staff of the delay in determining the initial outage duration within six hours and the notification will occur in an expedited manner as information becomes known. Following a nighttime storm, the determination of whether the restoration period will be less than 48 hours (or less) will be communicated as soon as possible, but no later than noon the following day. Any delay in establishing the initial storm expectations will <u>not</u> affect the time requirements below.
Within the first 12 hours of the restoration period
<ul style="list-style-type: none"> • Provide regulatory authorities with a global ETR and any available regional ETRs. • Prepare a statement for the press that includes known ETRs for the next upcoming news cycle and communicate with affected municipal and governmental officials (may or may not be by way of a municipal conference call).
Within the first 18 hours of the restoration period
<ul style="list-style-type: none"> • Establish ETRs for each locality affected and make them available to the public via customer representatives, IVR systems, and websites.
Within the first 24 hours of the restoration period
<ul style="list-style-type: none"> • Consider issuing a press release for the upcoming news cycle based on conditions.
Reporting requirements during the event
<ul style="list-style-type: none"> • Provide restoration information updates daily to regulatory authorities. Updates should continue until otherwise directed by Staff. • Notify regulatory authorities when all storm-related interruptions have been restored.

Table 15: Restoration activities for events 48 hours or less

Type 1 and 2 Events expected to last greater than 48 hours**Within the first 6 hours of the restoration period**

- The utility shall indicate that it will be a multi-day event (i.e., greater than 48 hours). The notification shall be made to regulatory authorities and will state what LUMA has defined as the start of the restoration period.
- Provide a public statement indicating the likelihood of extended outages and make this information available via customer representatives, IVR systems, and websites.
- In certain situations (e.g., nighttime events), only limited information may be available within the initial six-hour window. In these situations, the expectation is that the companies will inform regulatory authorities of the delay in determining the initial outage duration within six hours and the notification will occur in an expedited manner as information becomes known. Following a nighttime storm, the determination of whether the restoration period will be greater than 48 hours will be communicated as soon as possible, but no later than noon the following day. Any delay in establishing the initial storm expectations will not affect the time requirements below.

Within the first 12 hours of the restoration period

- Prepare a press release for issuance in time for the next upcoming news cycle and communicate with affected municipal and governmental officials (may or may not be by way of a municipal conference call).

Within the first 18 hours of the restoration period

- Schedule municipal conference call(s) unless an alternative municipal contact method is more appropriate. The first scheduled municipal conference call itself does not necessarily have to fall within the first 18 hours but shall be within the first 36 hours.

Within the first 24 hours of the restoration period

- Notify regulatory authorities of what areas sustained the most damage to the electric system and ETRs, where known, on a general geographic basis.
- Issue a press release(s) for upcoming news cycles with the information described in the previous bullet.

Within the first 36 hours of the restoration period

- For storms with expected restoration periods of five days or less, provide regulatory authorities a global ETR.
- Establish regional/county ETRs for areas expected to be restored in five days, even if the total restoration period is expected to be over five days.
- Identify any heavily damaged areas where large numbers of customers are expected to remain without service for more than five days.
- The utilities must have completed the first scheduled municipal conference call.
- Make ETR information available to the public via customer representatives, IVR systems, and websites.

Within the first 48 hours of the restoration period

- For storms with expected restoration periods of five days or less, provide regulatory authorities a global ETR.
- Establish regional/county ETRs for areas expected to be restored in five days, even if the total restoration period is expected to be over five days.
- Identify any heavily damaged areas where large numbers of customers are expected to remain without service for more than five days.
- The utilities must have completed the first scheduled municipal conference call.
- Make ETR information available to the public via customer representatives, IVR systems, and websites.

Beyond the first 48 hours of the restoration period	
<ul style="list-style-type: none"> For storms with expected restoration periods of more than five days provide, estimated restoration times for each locality affected and make the information available via customer representatives, IVR systems, and web sites. 	
Reporting requirements during the event	
<ul style="list-style-type: none"> Provide restoration information updates daily to regulatory authorities, which shall continue until otherwise directed by Staff. 	

Table 16: Restoration activities for events greater than 48 hours

9 Direction, Control, and Coordination

Emergency response procedures parallel normal operational procedures to minimize the need for specialized training or work practices. This Annex provides the framework for the systematic response of resources when emergencies arise and defines a set of processes and protocols for determining the appropriate level of response during major emergencies for:

- Restoration of electric service.
- Emergency response progress notification of applicable government agencies, customers, public, and employees.
- Response to official requests for specific incidents, events, or actions.
- Response to natural or man-made events that involve LUMA's facilities.

For additional information related to direction, control, and coordination, refer to the ERP – Base Plan, Section 7.

10 Communications

LUMA strives to provide timely, accurate, and consistent communications prior to and during a Major Outage Event as details become available. Emergency communications may include alerts and warnings from the National Weather Service, or other verified emergency notifications of events that may affect electric service. Communications may include information regarding evacuation, curfews, other actions for protective measures, LUMA response and restoration status, available assistance, and other matters that impact LUMA's response and recovery.

The Public Information Officer (PIO) is responsible for communicating necessary and critical information externally. LUMA will communicate information externally through a variety of methods including:

- LUMA's website and Customer Outage Map
- Media Outlets
- Social messaging including the use of Twitter, Facebook, and WhatsApp, among others
- Situational Reports to Local, Municipal, and Government of Puerto Rico agencies
- Incorporation of Amateur Radio Operators (as needed)
- Joint Information Center (JIC)

10.1 Public Service Announcements (PSAs)

The IC must approve the final draft of all PSAs prior to their dissemination by the PIO or other designees.

Public statements may include the following confirmed information:

- Number of customers affected
- Affected regions
- Numbers of crews
- Estimated time of restoration (ETR)
- Cause of the outage/event
- Warnings regarding hazardous conditions and public safety information
- Description of emergency response actions already taken
- Customer Service phone numbers for customers to report outages or damage, a Company website link to report outages and access restoration information, and links to relevant social media platforms

PSAs are distributed to the following stakeholders:

- Customer Experience Teams
- Employees
- Media outlets
- Elected Officials
- Local Municipal Officials
- Regulatory and State Governmental Agencies

10.2 Media Communications

Prior to and during an emergency event, a PIO media team member is available to media outlets for information regarding company activities in addition to regularly scheduled PSAs. In larger, more extensive emergencies, it may be desirable to schedule news media briefings and have an appointed spokesperson available for press conferences.

The PIO team is responsible for communicating with a full range of broadcast, news, and online and print media outlets, ensuring timely and clear communication of all vital messaging. The PIO team formulates press releases and coordinates appropriate interviews and provides periodic status updates throughout an event and afterward.

In addition, the team maintains focus on storm-related threats, including flooding, and shares all available safety and restoration information, recommendations for preparing for flooding or evacuation, safety precautions, and suggested steps to arrange for reenergization (if a home or area has been de-energized due to flooding or other conditions).

The goals are to:

- Provide accurate, timely information to the media, customers, local elected officials, local municipal officials, and employees.
- Demonstrate preparedness by proactive and diligent communication.

10.3 Digital Communications

Prior to a known event, the PIO digital communications team member, reviews and update the Company's website content. During the event, the PIO digital communications team member posts PSAs on the website and that content is current.

The Outage Map displays outage and restoration information geographically and in tabular format and is provided by region or town including customers served and customers impacted on the tabular side. Geographically, customers also see outage information and an estimated outage location. If possible, regional ETRs are then shared via social media channels.

10.4 Employee Communications

Internal communications are prepared and distributed before, during, and after an event, by the PIO team through multimedia platforms to employees. Information and updates, expectations for their support, and the nature, scope, and status of LUMA's restoration response is included. Messages include information consistent with that released to the general public, including safety tips regarding specific types of dangers so employees may prepare their families for possible demanding assignments and extended shifts that come with a severe storm or other emergency.

Daily and overnight message notifications and postings are examples of typical communications and are sent by the PIO employee communications team. All information released is approved by the PIO and the IC.

- Topics can include:
- Weather updates
- Safety information
- Company preparations and activities
- Restoration status
- PSAs
- Customer feedback
- Link to event photos and videography
- Links to outage center

10.5 Regulatory Officials

The P3LNO communicates with regulatory and elected officials prior to and during an emergency event using email, conference calls, and individual phone calls or other means, as necessary.

Once a predicted emergency event is forecasted, the Reporting Unit prepares and submits Pre-Event Stage Reports, Event Stage Reports, and Post-event Stage Reports, as required by LUMA Major Outage Metrics, and submit to the appropriate agencies as required until outages occur. For additional information on reporting, refer to the ERP – Base Plan, Section 10.

10.6 Municipal Officials

During events where the State Regional EOCs are activated, LUMA Regional Interagency Coordinators (LRIACs from Alpha, Bravo, and Charlie shifts) provide staffing in the Regional EOCs to facilitate communications between the LEOC and state officials prior to, during and after an event and during the restoration effort in accordance with the LUMA Major Outage Metrics in Appendix A.

Supporting municipalities severely affected by emergency events aids in prioritizing the restoration of electric facilities and may improve access to company facilities by attaining municipal support services. Each LRIAC, during an emergency event, shall provide periodic reports to municipal officials, including emergency managers or their designees, that contain detailed information related to emergency conditions and restoration performance for each affected city and town

The content and format of these periodic reports (Pre-Event Stage Reports and Service Restoration Stage Reports) as required by the PREB and P3A regulatory agencies can be found in Appendix D to the ERP.

The following communications are carried out by the LRIACs to satisfy the regulatory reporting requirements:

- Scheduled conference calls with municipal officials, including emergency managers.
- Community liaison communications (telephonic, electronic and/or in-person) with municipal officials, including emergency managers.
- Communicate with key account customers.
- Provision of emergency conditions and restoration information, including but not limited to:
 - Outage and restoration information.
 - Priority down wire locations.
 - Critical facilities impacted by the emergency event, through a community website portal that may be accessed by municipal emergency managers.

11 Demobilization

Demobilization is the orderly, safe, and efficient return of an incident resource to its original location and/or status. The Incident Commander is responsible for initiating the De-escalation/De-mobilization process. Demobilization planning for de-escalation/de-mobilization is an on-going process that begins as soon as the response begins to facilitate accountability and ensure efficient resource management.

Tracking resource requirements and releasing those resources that are no longer required to support the response is essential for accountability and managing control. This assists in reducing the displacement of resources, reducing operating costs and ensuring resources are available for other activities and assignments as needed.

The Planning Section Chief develops demobilization plans and ensure they are implemented as instructed by the IC.

The ERO may be fully demobilized when:

- All storm-related jobs are assigned.
- Centralized Dispatch is managing events.
- All non-regional crews are released.

12 Annex Development and Maintenance

This Annex is a living document. Development and maintenance of this Annex are in conjunction with the LUMA ERP. Proposed changes should be sent to the Emergency Preparedness Department of Operations for approval and inclusion.

Please reference the LUMA ERP – Base Plan, Section 13, Plan Development and Maintenance, for additional information.

13 Explanation of Terms

13.1 Acronyms

CF	Critical Facilities
CISA	Cybersecurity & Infrastructure Security Agency
CLAL	Claims Unit Leader
CSL	Corporate Security Unit Leader
DA	Damage Assessment
DOCL	Documentation Unit Leader
DSOC	Distribution System Control Center
DVML	Donations/Volunteer Management Unit Leader
EOC	Emergency Operations Center ERO
ETR	Estimated Time of Restoration
FAQ	Frequently Asked Questions
FEMA	Federal Emergency Management Agency
FLUL	Food/Lodging Unit Leader FSC
HES	Hurricane Evacuation Study
HSEEP	Homeland Security Exercise and Evaluation Program
HVX	CureVac
IAP	Incident Action Plan
IC	Incident Commander
ICC	Incident Command Center ICS
IT	Information Technology Unit Leader
IVR	Interactive Voice Response
JIC	Joint Information Center
CF	Critical Facilities
CISA	Cybersecurity & Infrastructure Security Agency
CLAL	Claims Unit Leader
CSL	Corporate Security Unit Leader
DA	Damage Assessment
DOCL	Documentation Unit Leader
DSOC	Distribution System Control Center
DVML	Donations/Volunteer Management Unit Leader
EOC	Emergency Operations Center ERO
ETR	Estimated Time of Restoration
FAQ	Frequently Asked Questions
FEMA	Federal Emergency Management Agency
FLUL	Food/Lodging Unit Leader FSC
HES	Hurricane Evacuation Study
HSEEP	Homeland Security Exercise and Evaluation Program
HVX	Hurrevac

IAP	Incident Action Plan
IC	Incident Commander
ICC	Incident Command Center ICS
IT	Information Technology Unit Leader
IVR	Interactive Voice Response
JIC	Joint Information Center
CF	Critical Facilities
GLO	LUMA Generation Liaison Officer
HSEEP	Homeland Security Exercise Evaluation Program
HSEQ	Health Safety Environment & Quality
IAP	Incident Action Plan
IC	Incident Commander
ICS	Incident Command System
IPAWS	Integrated Public Alert & Warning System
IT	Information Technology
JIC	Joint Information Center
LEOC	LUMA Emergency Operations Center
LEOCM	LUMA Emergency Operations Center Manager
LNO	Liaison Officer
LRIAC	LUMA Regional Interagency Coordinator
LRS	Lifeline Residential Service (Customers)
LRS	Lifeline Residential Service
LSC	Logistics Section Chief
MMA	Mutual Aid Unit Leader
MMS	Materials Management System
MOU	Memorandum of Understanding
NHC	National Hurricane Center
NIMS	National Incident Management System
NWS	National Weather Service
OMS	Outage Management System
P&I	Planning and Intelligence
P3A	Puerto Rico Public Private Partnerships Authority
PIO	Public Information Officer
PREB	Puerto Rico Energy Bureau
PREMB	Puerto Rico Emergency Management Bureau
PRG	Priority Restoration Group
PROC	Procurement Unit Leader
PSA	Public Service Announcement
PSC	Planning and Intelligence Section Chief
QPF	Quantitative Precipitation Forecast
RC	Road Closure

RESL	Resources Unit Leader
RSR	Restoration Status Report
SCADA	Supervisory Control and Data Acquisition
SERT	System Emergency Restoration Team
SITL	Situation Unit Leader
SMS	Short Message Service
SOG	Standard Operating Guide
SUL	Supply Unit Leader
T&D	Transmission & Distribution
TCUL	Time & Cost Unit Leader
TRUL	Transportation/Fleet Unit Leader
TSOC	Chief Transmission System Control Operator

13.2 Terms

Assumptions – Operationally relevant parameters expected and used as a context, basis, or requirement for the development of response and recovery plans, processes, and procedures.

Critical Facilities – Critical facilities identified as Level 1,2, or 3 facilities provide services that are critical to the health and safety of the public and are tied to at least one of the seven critical community lifelines. Examples include hospitals, fire/police stations, restoration staging areas, and communications facilities.

Damage Assessment – A mechanism utilized to determine the magnitude of damage and impact of disasters.

Demobilization – The ongoing process of disengaging response resources as incident objectives are met and returning them to their normal function.

Disaster – An occurrence of a natural catastrophe, technological accident, or human-caused event that has resulted in severe property damage, deaths, and/or multiple injuries and exceeds the response capability of the local jurisdiction and requires the Government of Puerto Rico, and potentially Federal, involvement.

Emergency or Emergency Event – Any outage event, as per the T&D OMA; declared emergency or major disaster; or event, whether natural or manmade, that requires responsive action to protect life, property, and/or operational capacity where LUMA has deemed it an Emergency and/or necessary to activate the LUMA Emergency Operations Center.

Emergency Operations Center – The physical locations at which coordination of information and resources to support incident management activities occurs.

Emergency Response Organization – A structured organization with overall identified responsibilities for initial and ongoing emergency response and mitigation.

Emergency Response Plan – A comprehensive plan that provides the concept of operations for response to emergency situations and other extraordinary events consistently and effectively.

Geographic Information Systems – A framework used to map the distribution system with land base information.

Hurrevac - National Hurricane Program's hurricane decision support tool used to assist in decision-making and responding to tropical cyclone threats and evacuations.

Joint Information Center – A central point of contact for new media and interest parties to coordinate incident information activities.

Key Account Customers – Large industrial customers who may have their own electrical system to which LUMA supplies power.

Appendix A – Major Outage Metrics

Description	Metrics	Comments	Location						
1. Preparation Phase									
Completion of steps to provide timely and accurate emergency event preparation following an alert from the U.S. National Weather Service or the company's private weather service, or the government of Puerto Rico has declared a state of emergency or when an event is known to be imminent or has occurred, in accordance with the Emergency Response Plan, for an event expected to affect the company's service territory.	Completion of each step counts separately:								
	Event-level categorization is based on weather forecasts, system resiliency assessment and available resources.		Base Plan: Section 6.3. Annex A: Section 6.3						
	Press releases issued/text messages/emails sent.		Base Plan: Section 10.1 Annex A: Section 10.1						
	Municipal conference calls held.		Base Plan: Section 10.3 Annex A: Section 10.6						
	Critical & essential customers alerted — based on an established list with current information.		Base Plan: Section 10						
	Point of contact for critical facilities alerted — based on established list with current information.		Contact lists are stored separately						
	Company compliance with the training program as specified in the Emergency Response Plan.		Base Plan: Section 12.3						
	Participation in all pre-event mutual assistance group calls.		Base Plan: Section 7.3 Annex A: Section 7.1.5						
	Verify materials/stockpiles level based on the forecast. If materials are not on hand, corrective steps are taken in shortest reasonable time to correct the situation.		Base Plan: Section 4.2. Annex A: Section 6.2						
2. Downed Wires									
Response to downed wires reported by municipal public officials.	Once the joint reporting and response process is established, LUMA will respond to all reported downed wires and take appropriate action within a reasonable time (per the event categorization), working in conjunction with local authorities after a Major Outage Event. Reported means that the situation is tracked in the Customer Information System (CIS) by the official contacting LUMA call centers or reported through the Municipal Emergency Operations Center (EOC) through LUMA's Municipal Emergency Operations Center (MEOC) Liaison.	A reporting and response process on how these are managed needs to be put in place jointly with municipal public officials.	Base Plan: Section 6.6 Annex A: Section 7.3.1						
	<div><div>Reasonable Time</div><table><tr><th>Event Category</th><th>Response Time</th></tr><tr><td>3 to 5 days</td><td>18 hours</td></tr><tr><td>5 to 10 days</td><td>36 hours</td></tr><tr><td>> 10 days</td><td>60 hours</td></tr></table></div>	Event Category		Response Time	3 to 5 days	18 hours	5 to 10 days	36 hours	> 10 days
Event Category	Response Time								
3 to 5 days	18 hours								
5 to 10 days	36 hours								
> 10 days	60 hours								

Description	Metrics	Comments	Location								
3. Damage Assessment											
	<p>After the beginning of the Major Outage Event and when it is safe to do so, LUMA will begin a preliminary damage assessment of the affected area(s) or T&D facilities.</p> <p>The preliminary damage assessment will be completed within a “reasonable time” at the beginning of the Operation Response phase. The preliminary damage assessment will be done primarily with helicopter patrol and very limited specific land patrol to address helicopter assessment questions.</p> <p>Concurrent with the start of the preliminary helicopter assessment, LUMA will begin a more thorough damage assessment.</p> <p>Reasonable Time</p> <table><tr><th>Event Category</th><th>Response Time</th></tr><tr><td>3 to 5 days</td><td>36 hours</td></tr><tr><td>5 to 10 days</td><td>72 hours</td></tr><tr><td>> 10 days</td><td>120 hours</td></tr></table>	Event Category	Response Time	3 to 5 days	36 hours	5 to 10 days	72 hours	> 10 days	120 hours		Annex A: Section 7.1.7
Event Category	Response Time										
3 to 5 days	36 hours										
5 to 10 days	72 hours										
> 10 days	120 hours										
4. Crewing											
50% of the forecast crewing [from mutual assistance] committed to the utility.	<p>50% of the forecast crewing [from mutual assistance] committed to the utility.</p> <p>Three (3) days prior to a forecasted event occurring (when the event allows that much warning time), LUMA will complete a “damage prediction” to determine crew requirements. Based on this damage prediction, the number of mutual assistance crews will be determined.</p> <p>LUMA will stage materials, equipment, and personnel at the required location prior to the weather event striking the area.</p> <p>Within 24 hours of the damage prediction, 50% of indicated internal crews and qualified contract crews will be deployed.</p> <p>Within 48 hours of the damage prediction, 80% of the indicated internal crews and qualified contract crews will be mobilized on island.</p>		Annex A: Section 7.1.2								
5. Estimated Time of Restoration (ETR) for 90% of Service Outages											
Estimated Time of Restoration for 90% of service outages (made available LUMA on web, IVR, to Customer Service Representatives (CSRs), etc.)	Publication of regional ETRs in accordance with guidelines.		Annex A: Section 8								
	Publication of municipal ETRs in accordance with guidelines.		Annex A: Section 8								
	A preliminary ETR for 90% service restoration will be made available on the Internet 24 hours after the preliminary damage assessment in pdf format.		Annex A: Section 8								
	ETRs on 90% service restoration to be made available on IVR and to CSRs by a municipality or region.		Annex A: Section 8								

Description	Metrics	Comments	Location
	All ETRs are to be updated every 24 hours.		Annex A: Section 8

6. ETR Accuracy for 90% Service Restoration

Regional ETR accuracy	Accuracy for 90% of service outage restoration and published in accordance with ETR requirement time. The ETRs used for this metric will be the ETRs posted after the thorough damage assessment is completed and not based on the preliminary damage assessment.		Annex A: Section 8
Municipal ETR accuracy			

7. Municipality Coordination

Coordination with municipalities regarding road clearing, downed wires, critical customers, etc.	Through the Municipal EOC, the LUMA local Incident Command Center (ICC) Municipal Liaison will attend all scheduled Situation Report (SITREP) meetings. The Liaison will be the conduit for ICC information and requests. To track, the Municipal EOC must be activated so that all requests flow through it.		Base Plan: Section 10.3 Annex A: Section 10.5.
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8. Municipal EOC Coordination Puerto Rico Commonwealth/Federal EOC Coordination

Coordination with municipal Puerto Rico Commonwealth and Federal EOCs.	Through the Commonwealth and Federal EOCs, the LUMA Liaisons will attend all scheduled meetings. The Liaison will be the conduit for ICC information and requests. To track activity, the State and Federal EOCs must be activated and not a request from elected officials.		Base Plan: Section 10.3 Annex A: Section 10.5
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9. Utility Coordination

Coordination with other utilities (communications, water, etc.)	Establish contact points between utilities.		Base Plan: Section 7.2
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10. Safety

Measure of any employee or contractor injured doing hazard work during storm/outage and restoration.	Record safety incidents and include them in a safety report per LUMA Health Safety Environment & Quality (HSEQ) standard.		Base Plan: Section 8.1 Annex A: Section 5.1
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Description	Metrics	Comments	Location
11. Mutual Assistance			
Crew requests made through all sources of mutual assistance or other pre-negotiated contracts with utility service providers.	<p>Three (3) days prior to a forecasted event occurring (when the event allows that much warning time), LUMA will complete a damage prediction to determine the requirements for on and off-island mutual aid/pre-negotiated contracts with other utility service providers. LUMA will activate the required resources and place them on standby until the damage assessment is completed.</p> <p>After the initial damage assessment is completed, the requests for mutual assistance or other utility service provider crews will be made as follows: Within 70 hours, 40% of crews After 120 hours, 80% of committed mutual aid and other utility service provider crews will be requested.</p>		Base Plan: Section 7.3 Annex A: Section 7.1.
12. Call Answer Rates			
Customer calls answered by properly staffed call centers (use of IVR and other technology is an acceptable solution).		TBD depending on the size of a major event.	Base Plan: Section 10.2 Annex A: Section 10
13. Web Availability			
Company's website, specifically the section pertaining to outage impact and restoration, must be available around the clock during a major storm event, and information must be updated hourly until final restoration. In the event that no new information is available, the website must display the last time and date that information was updated. The website and/or section pertaining to outage impact and restoration may be taken offline for a short period during off-peak hours to perform system maintenance.			Base Plan: Section 10.2 Annex A: Section 10.3
14. PREB and Administrator (P3A) Reporting			
Provide storm event information to PREB and Administrator in accordance with LUMA's Electric Outage Management System (OMS) guideline requirements to be established in the ERP for LUMA.	Information to be updated every 24 hrs.		Base Plan: Section 10.3 Annex A: Section 10.5
15. Customer Communications			
Availability of press releases, text messaging, email, and social media.			Base Plan: Section 10 Annex A: Section 10

Description	Metrics	Comments	Location
16. Outgoing message on a telephone line			
Recorded message providing callers with outage information is updated within two hours of communication of press releases.		Available at Service Commencement Date. IVR will be managed in house.	Base Plan: Section 10.2 Annex A: Section 10.1

Table 17: Summary of Major Outage Performance Metrics

Note that the Major Outage Event metrics are subject to change and subject to review and approval by PREB.

Appendix B – LUMA ICS Divisional Structure

Refer to the Base ERP – Appendix A for the LEOC Command and General Staff Structure. Each of the 6 ROCCs operates under a similar organizational structure.

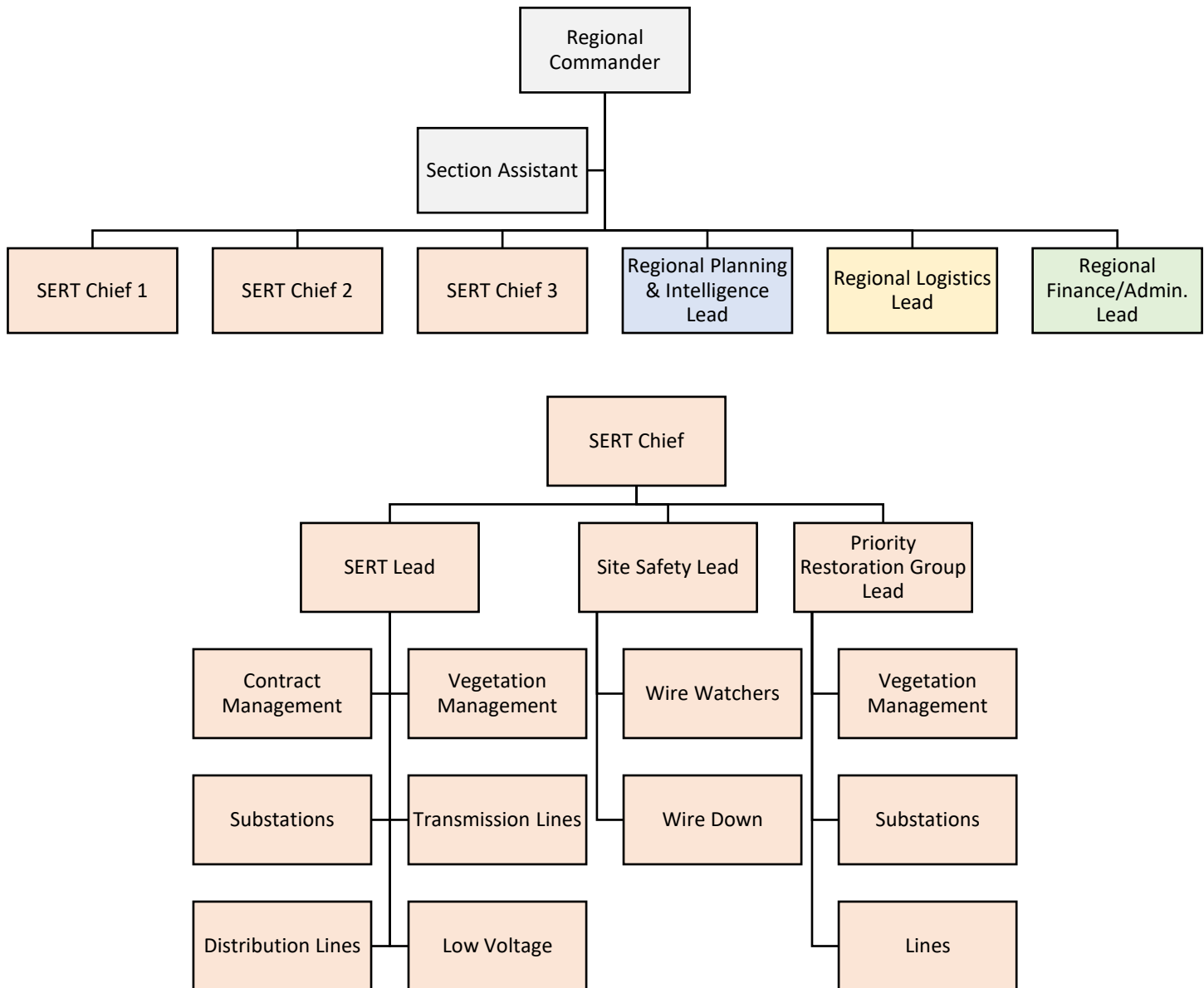


Figure 4: ICS divisional structure



Emergency Response Plan

Annex B – Fire Response

LUMA ENERGY

CRISIS MANAGEMENT

May 27, 2022

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1 Purpose

The purpose of LUMA's Fire Response Annex (Annex B) is to describe the key functions that LUMA implements to address fire-specific events that affect facilities and infrastructure that provide electric service throughout Puerto Rico.

Annex B provides guidance to assist in protecting lives and property and maintaining continuity of service throughout the electric grid when affected by any minor or major fire-related incident or event. A vital feature of Annex B is scalability which allows for expansion and retraction of responding resources depending on the severity of the emergency. Many emergencies are manageable at a local or internal level but can quickly escalate to a system-wide emergency.

2 Scope

Annex B applies to emergency events caused by a fire event or fire-related hazards that result in, or could result in, a major impact on the integrity of the Transmission and Distribution System (T&D System) and/or any other disruption of electrical service to LUMA customers. Execution of coordinated decisions, appropriate responses, and actions to activate resources contributes to a rapid and safe recovery and depends upon the scalability of this Annex.

3 Situations and Assumptions

3.1 Situation

LUMA's ability to respond to an emergency fire event or fire-related hazards to lessen the effects of power outages on customers depends upon a combination of coordinated decisions internally and externally regarding local emergency services personnel and resources. Uncontrolled fire events have the potential to expand into a major emergency and can negatively affect the safety of others, property, and the ability of LUMA to provide continuous electric service to its customers.

The effectiveness of Annex B is predicated on LUMA's commitment to prepare and implement guidance and best practices outlined within Annex B and the Emergency Response Plan (ERP) – Base Plan. Execution of the appropriate responses to affect rapid and safe recovery is dependent upon the scalability of Annex B. The number of customers affected and the magnitude of a major outage event vary, but the operational concept stays consistent. The level of recovery resources can be adjusted as needed.

Additional natural or man-made hazards may require a change in the Event Type which requires flexibility of this Annex. There are five (5) Event Types described in the Event Classification and LUMA Emergency Operations Center (LEOC) Activation Table, located in the ERP Base Plan, Appendix A.

3.2 Assumptions and Considerations

LUMA's ability to respond to and recover from any type of incident that may affect the T&D System is critical. The concepts for the response, restoration, and recovery are outlined within the ERP – Base Plan and Annex A, Major Outage Restoration. Identified below are additional assumptions and considerations regarding response to emergency incidents, such as fire, which include, but are not limited to the following:

- Damage assessment(s) determines the impact and magnitude of damages and should be conducted within a reasonable timeline.
- Damage assessment reports identify affected geographic area(s) which contribute to the estimated time of restoration baseline projection.
- Normal resources and processes for support to impacted areas for power restoration may not be enough due to the severity and duration of the outage and the extent of the damage.

- Natural and man-made emergencies, such as facility or infrastructure fire(s), may necessitate the utilization of local fire service resources.
- Fire events may present issues that require a response by law enforcement, fire departments, electric and water/wastewater utilities, public health authorities, and environmental protection agencies. In these cases, effective interagency coordination utilizing the National Incident Management System (NIMS)/Incident Command System (ICS) is essential.
- Minor or major emergency events, disasters, and acts of terrorism may adversely impact local available public safety personnel, equipment, facilities, and communications systems.
- Mutual Aid Agreements (MAA) or Memorandum of Agreements (MOA) are maintained and activated when the scope of the incident requires additional resources beyond LUMA's capabilities.
- Potential weather conditions may affect the response and restoration actions.
- Assessment, prioritizing, and scheduling of repairs are conducted throughout the response and restoration process.

4 Concept of Operations

If an emergency event results in or may result in damages to facilities or power outages, LUMA responds and rapidly assesses the impacts on the T&D System infrastructure and take the necessary actions to mitigate cascading effects from continual power outages and implement restoration protocols.

To ensure response integration, the Puerto Rico Emergency Management Bureau's (PREMB) Incident Levels and LUMA's Event Classification Types are utilized and identified in the ERP – Base Plan.

4.1 LEOC Activation

The efficient activation of emergency response personnel is critical to the success of any response. Fires and fire-related hazards can affect LUMA operations outside daily blue skies operational boundaries. The Incident Commander (IC) is responsible for analyzing the severity, complexity, and size of the incident (and therefore choosing an Event Classification Type) with the collaboration and input of the Command Staff to determine if a fire triggers the activation of the LEOC. LUMA may activate the Crisis Management Committee (CMC), Command Staff, and General Staff to support the response.

4.1.1 No-Notice Incidents

A no-notice incident occurs unexpectedly or with minimal warning. No-notice incidents do not provide emergency responders enough time to prepare for the specific event. Fire is an example of a no-notice incident. During a no-notice event, the determination of an Event Classification Type is typically needed before the establishment of a LEOC Activation Level. This is done by the Incident Commander (IC) once designated by the CMC.

4.2 LUMA Event Classification Types

The Event Classification Type depends upon the analysis of the expected severity and complexity of an event and is drawn from the consideration of numerous factors. The LUMA Event Classification Types and their anticipated operating conditions are described in Section 6 of the ERP and Section 7 of Annex A.

4.3 Restoration Operations

Restoration Operations conducted in response to an event impacting LUMA's distribution and transmission scheme are the responsibility of the Planning and Dispatch Team. Directives from the LEOC follow the LUMA Restoration Strategy and the Concept of Operations, both of which can be found in full in the Major Outage Restoration Annex (Annex A, Sections 6 and 7).

4.3.1 Approach

During a fire, the Operations Section is responsible for assessing the damage to the T&D infrastructure. To carry out this strategy, the Regional Operations Control Centers (ROCCs) across the island report to the Division Branch Director(s), who directs the response of field teams.

The transition from response operations to restoration operations takes place during the time when (1) restoration personnel in the field can be deployed without unacceptable safety risks due to the continuation of hazardous conditions and (2) when the potential additional damage to the T&D System is low in proportion to the expected level of damage already suffered.

The start of restoration operations may be different for specific areas where the effect of the incident caused other adverse conditions such as additional debris and limiting access to damaged areas.

When a fire occurs, an effective response to restoration transition occurs when timely and accurate information is provided which includes, but is not limited to, the following.

- Number of clients out of service.
- Amount of damage to the T&D infrastructure.
- Labor (along with their availability) to repair the damage.

After an interruption to the T&D System and activation of the ERP, the restoration of electrical services is carried out by following four basic steps:

1. Make Safe Protocols
2. Damage Assessment (Rapid and Detailed Assessment)
3. Prioritization of Restoration
4. Execution of Tactical Restoration Operations

4.3.2 Mobilization of Personnel

Most fires typically occur with little to no warning. Therefore, LUMA may be required to institute a safe deployment of resources depending on the Event Classification Type.

The most critical component to mobilizing personnel is flexibility in order to adapt as the threat becomes more certain.

- The IC is responsible for notifying the Command Staff of LEOC activations.
- The IC may activate other roles based on incident developments and the Event Type.
- Notifications are made in accordance with the LUMA Performance Metrics for the Mobilization of Personnel located within the ERP - Annex A.

4.3.3 Damage Assessment

A Damage Assessment (DA) is a key component of the restoration operation. Assessment personnel is managed through the Regional System Emergency Restoration Teams (SERTs) and provide their report to the Regional Commander. The order of evaluation is based on the Restoration Priority Matrix Guidelines identified within Annex A, Section 7.3.

- The T&D System Control Center monitors and develops an initial system status report. This report is used to compare the current level of electric demand on the system to the forecasted demand.
- The DA report is disseminated to the Operations Section in the LEOC, where resources and equipment requirements are identified.
- Regional SERT teams execute restoration operations identified by the LEOC and Regional Commanders.

4.3.4 Restoration

As outlined in Annex A, LUMA follows restoration processes safely and efficiently to repair damage and restore electrical service. Field damage assessments and repairs can begin when:

- Field personnel can be deployed without safety hazards or dangerous conditions.
- The potential for additional damage to the T&D System is low.

Prioritization

Outages are prioritized by:

- Safe working conditions.
- Damage to LUMA facilities and/or infrastructure.
- Critical Community Lifelines, customer type, and the number of affected customers.
 - LUMA identifies a summary of Major Outage Event Performance Metrics located within the ERP, Annex A.

Situational Assessment

LUMA completes an evaluation of the system through the Supervisory Control and Data Acquisition (SCADA), Outage Management System (OMS) and reported outages from LUMA customers. When the Event Classification Type has been determined, staff are assigned according to the structure of the LUMA identifiers.

4.3.5 Emergency Fire Event Conditions

The Restoration Priority Matrix and Critical Facility Level protocols are consistent in both normal and emergency operations for any type of event. Municipal emergency response resources, such as law enforcement and/or fire departments that respond to the incident, should provide LUMA with the status of the area/facility before a damage assessment can be conducted.

4.3.6 Make Safe Protocols

During an incident, the number of resources that are trained and readily available may be limited, and the demand could greatly exceed those available. LUMA ensures “make safe” actions are taken and acknowledges it may be necessary to contract additional resources to support make safe and restoration activities.

5 Estimated Time of Restoration

Damages that cause Transmission or distribution interruption due to fire, and fire-related hazard(s) which may impede restoration operations, must be investigated upon notification of an impending or immediate incident.

Subsequently, timely and accurate Estimated Times of Restoration (ETRs) are provided to all LUMA customers and stakeholders. Providing accurate ETRs is a top priority of LUMA's overall restoration process.

The flexibility of an event requires a strategic, deliberate, planning-oriented posture that allows a utility to plan:

- Resource needs
- Operational periods
- Strategic objectives
- Staff fatigue
- External communications

Expected actions related to ETRs are found in ERP Annex A, Section 8.

6 Organization

This section describes the key functions of the various components and positions of the organizational structure. An orderly and consistent flow of information between operations, communications, logistics, and partner support organizations is necessary in times of major outage events. LUMA has seven Emergency Operations Centers (EOCs): the LEOC and six ROCCs. The organizational charts indicating the lines of authority and the interrelationship between the organizational groups can be found in Appendix A of the Annex A.

6.1 LUMA Leadership

Following a fire, LUMA leadership maintains an ongoing and open dialogue to discuss and share information about the impact on the T&D System. This dialogue ensures full situational awareness among leadership teams and provides a platform to facilitate discussions on the possible exchange of staff resources and other support functions between entities.

This approach provides the mechanism for consistent messages to employees, customers, and other external stakeholders. Following a fire or fire-related hazard(s), the LUMA leadership team and the CMC activate the applicable functional areas as needed.

6.2 Emergency Response Organization

The organizational structure of LUMA during outage restoration can be found in Appendix A of Annex A. Refer to the LUMA ERP – Base Plan for a list of roles and responsibilities.

7 Direction, Control, and Coordination

This Annex provides the framework for a systematic response when fire-related incidents occur and restoration operations are required. Determination of an appropriate response is based on multiple factors which include:

- Damage Assessment(s)
- Determination of Event Classification Type
- Coordinated response utilizing the Incident Command System (ICS)

The LUMA ERP, its Annexes and Appendices, identify the framework to respond to and recover from natural and man-made events. For additional information related to direction, control, and coordination, refer to the ERP – Base Plan, Section 8.

8 Communications

LUMA provides timely, accurate, and consistent communications following a fire. Emergency communications may include alerts and warnings from verified emergency notifications. Communications may include information about protective measures, LUMA response and restoration status, available assistance, and other matters affecting LUMA's response and recovery.

The LUMA PIO communicates timely and accurate information. LUMA communicates information through a variety of methods, including but not limited to the following:

- LUMA website and customer outage map
- News media
- Social messaging including the use of Twitter, Facebook, and WhatsApp, among others

LUMA has established a consistent messaging platform that is flexible enough to allow for internal or external expansion, depending on the Event Classification Type. The Event Classification Type chart can be found in Appendix A of the ERP - Base Plan.

9 Demobilization

The IC has the responsibility to initiate the De-escalation/Demobilization process. Demobilization is the orderly, safe, and efficient return of operations, facilities, and resources to their pre-incident status. Demobilization planning is an on-going process that facilitates accountability and ensures efficient resource management.

Tracking resource requirements and releasing those resources that are no longer required to support the response is essential for accountability and managing incident control. This assists in reducing the loss of resources, limiting operating costs and ensuring retention and availability of resources for other activities and assignments as needed.

The Planning and Intelligence Section Chief (PSC) develops demobilization plans and ensure they are implemented as instructed by the IC.

The emergency response operations may be fully demobilized when:

- All event-related jobs are assigned.
- Centralized Dispatch is managing the event.
- All non-regional crews are released.

10 Training and Exercises

The successful response to emergency events requires a Company-wide commitment to preparedness that is integrated into LUMA's daily operations, not just during incidents. Emergency preparedness activities can include planning, training, and participating in exercises; attending meetings with public safety officials, Crisis Management Department staff, and PREMB personnel; and maintaining updated contact information of personnel and organizations that may assist in LUMA's restoration efforts. Every employee is expected to participate in preparedness activities throughout the year.

The Crisis Management Department maintains the ERP-related training database and coordinates ERP role-related training. Training, drills, and exercises are designed and conducted to develop and improve the knowledge and skills of personnel assigned to emergency response activities and support the safe and reasonably prompt completion of all required actions during ERP activations.

The LUMA exercise program is consistent with the Homeland Security Exercise Evaluation Program (HSEEP) developed by the Federal Emergency Management Agency (FEMA). The HSEEP methodology is defined and implemented using seven exercise types, broken into the categories of discussion-based exercises and operations-based exercises. LUMA employs a variety of these exercise types based on the exercise goals and objectives. The goal of conducting exercises is to enhance training, improve familiarization, evaluate and/or validate plans, policies, and procedures, increase capabilities, and practice skills in a no-fault, risk-free environment.

11 Annex Development and Maintenance

This Annex is a living document. Development and maintenance of this Annex are in conjunction with the ERP – Base Plan. Proposed changes should be sent to the Crisis Management Department for approval and inclusion.

Please reference the ERP – Base Plan, Section 13, Plan Development and Maintenance, for additional information.

12 Explanation of Terms

12.1 Acronyms

CMC	Crisis Management Committee
DA	Damage Assessment
EOC	Emergency Operations Center
ERO	Emergency Response Organization
ERP	Emergency Response Plan
ETR	Estimated Time of Restoration
FEMA	Federal Emergency Management Agency
HSEEP	Homeland Security Exercise Evaluation Program
IAP	Incident Action Plan
IC	Incident Commander
ICS	Incident Command System
JIC	Joint Information Center
LEOC	LUMA Emergency Operations Center
MAA	Mutual Aid Agreement
MOA	Memorandum of Agreements
NIMS	National Incident Management System
OMS	Outage Management System
P&I	Planning and Intelligence
PIO	Public Information Officer
PREMB	Puerto Rico Emergency Management Bureau
PSC	Planning and Intelligence Section Chief
ROCC	Regional Operations Command Center
SCADA	Supervisory Control and Data Acquisition
SERT	System Emergency Restoration Team
T&D	Transmission & Distribution

12.2 Terms

Assumptions – Operationally relevant parameters expected and used as a context, basis, or requirement for the development of response and recovery plans, processes, and procedures.

Damage Assessment – A mechanism utilized to determine the magnitude of damage and impact of incidents.

Demobilization – The ongoing process of disengaging response resources as incident objectives are met and returning them to their normal function.

Disaster – An occurrence of a natural catastrophe, technological accident, or human-caused event that has resulted in severe property damage, deaths, and/or multiple injuries and exceeds the response capability of the local jurisdiction and requires the Government of Puerto Rico, and potentially Federal, involvement.

Emergency or Emergency Event – Any outage event, as per the T&D OMA; declared emergency or major disaster; or event, whether natural or manmade, that requires responsive action to protect life, property, and/or operational capacity where LUMA has deemed it an Emergency and/or necessary to activate the LUMA Emergency Operations Center.

Emergency Operations Center – The physical locations at which coordination of information and resources to support incident management activities occurs.

Emergency Response Organization – A structured organization with overall identified responsibilities for initial and ongoing emergency response and mitigation.

Incident Action Plan – Includes the overall incident objectives and strategies established by the Incident Commander. The Planning Section is responsible for developing and documenting the IAP.

Incident Commander – The individual appointed by the Company's Crisis Management Committee (CMC) to have overall responsibility for LUMA's response during an incident.

Incident Command System - Coordinated and collaborative incident management construct specifically designed and made a part of the National Incident Management System ("NIMS") under the Federal Emergency Management Agency ("FEMA").

Joint Information Center – A central point of contact for new media and interest parties to coordinate incident information activities.

System Level ERO – Multi-regional Emergency Response Organization.

Appendix A – Hazards Assessment

For some areas in Puerto Rico, the dry season starts around January and extends throughout April. In May, the island experiences relief from dry conditions in some areas. Dry conditions begin to develop again around June, continuing throughout August. In Puerto Rico, the southern region is characteristically dry all year-round. This makes the zone prone to wildfires from January through May (mostly February) because of low precipitation. The vegetative material and the hydrated flora do not burn; there has to be an accelerant for it to burn. Due to the abundance of woody debris/fuel following Hurricane Maria, there was an increase in wildfires the within green and hydrated areas. It is estimated that Puerto Rico experiences 2,000 to 5,000 forest fires annually.

Electrical Hazards

Substations and electrical facilities contain combustible materials that can create fires and explosions due to shorts or equipment damage. The fires are generally created as a result of other equipment failure. Still, due to the nature of the assets, the fires can result in large outages and complicated restoration conditions.

Tree Hazards

After a fire, many trees are weakened from burning around the base of the trunk. The trees can fall over or blow-down without warning. Shallow-rooted trees can also fall.

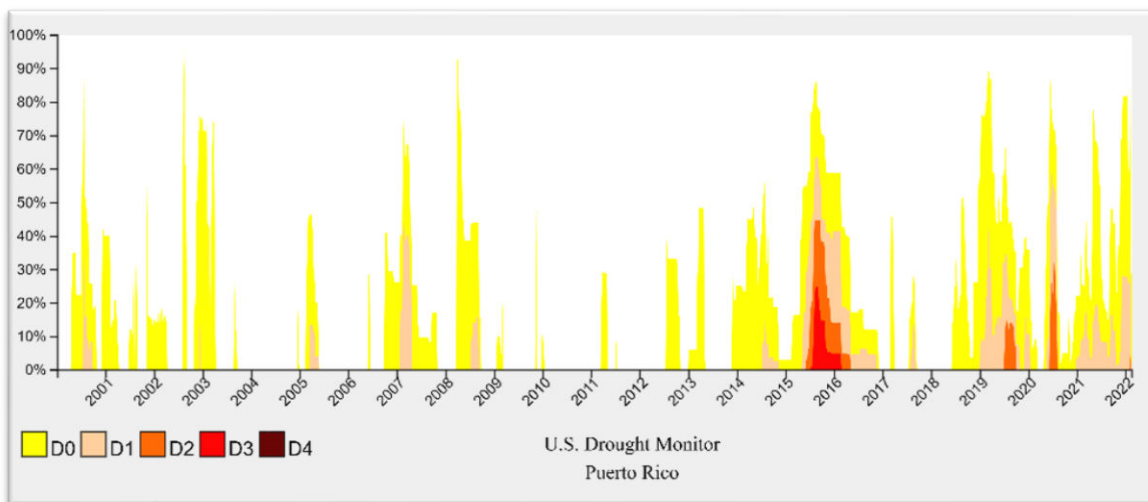


Figure 1: Drought monitor for Puerto Rico, 2001-2022



Emergency Response Plan

Annex C – Earthquake Response

LUMA ENERGY

CRISIS MANAGEMENT

May 27, 2022

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1 Purpose

The purpose of LUMA's Earthquake Response Annex (Annex C) is to describe the key functions that LUMA implements in response to an earthquake or earthquake-related hazard that affects the Puerto Rico Transmission and Distribution System (T&D System) facilities and infrastructure that provide electric service throughout Puerto Rico.

Annex C provides guidance to assist in protecting lives and property and maintaining continuity of service throughout (T&D System) when affected by any minor or major earthquake or earthquake-related incident or event. A vital feature of this Annex is scalability which allows for expansion and retraction of responding resources depending on the severity of the emergency outage event. Many emergencies are manageable at a local or internal level but can quickly escalate to a system-wide emergency.

2 Scope

Annex C applies to emergency events caused by earthquakes and earthquake-related hazards that result in, or could result in, a major potential impact to the integrity of the T&D System and/or a disruption of electrical service to LUMA customers. Execution of coordinated decisions, appropriate responses, and actions to activate resources contributes to a rapid and safe recovery and depends upon the scalability of this Annex.

3 Situations and Assumptions

3.1 Situation

Annex C applies to emergency events caused by earthquakes and earthquake-related hazards that result in, or could result in, a major potential impact on the integrity of the T&D System and/or a disruption of electrical service to LUMA customers. Execution of coordinated decisions, appropriate responses, and actions to activate resources contributes to a rapid and safe recovery and depends upon the scalability of this Annex.

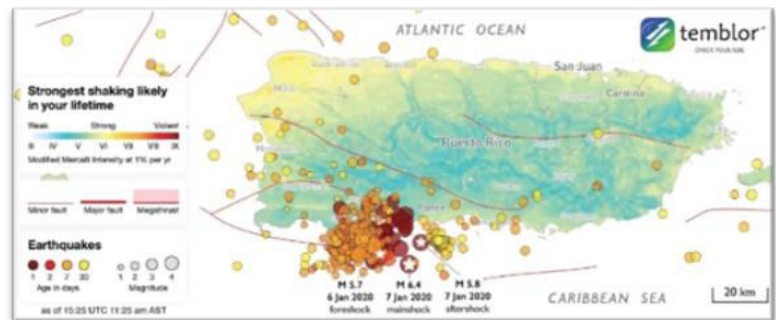


Figure 1: Puerto Rico earthquakes, Dec 2019 - Jan 2020



Figure 2: Major geographical faults overlapping map of power generation facilities

The effectiveness of this Annex is predicated on LUMA's commitment to prepare and implement the guidance and best practices outlined within this Annex and the rest of the Emergency Response Plan (ERP). Execution of the appropriate responses to affect rapid and safe recovery is dependent upon the scalability of this Annex. The number of customers affected, and the magnitude of a major outage event may vary, but the operational concept stays consistent. The level of recovery resources can be adjusted as needed.

3.2 Assumptions and Considerations

LUMA's ability to respond to and recover from any type of incident that may affect the T&D System is critical. The concepts for the response, restoration, and recovery are outlined within the ERP – Base Plan and Annex A, Major Outage Restoration. Identified below are additional assumptions and considerations regarding response to an earthquake which include, but are not limited to the following:

- Earthquakes of high magnitude can inflict serious structural damage to electrical infrastructure and facilities.
- Cascading effects of earthquakes may include additional damages, large quantities of debris, and simultaneous fires.
- Earthquakes can trigger earthquake-related hazards, such as aftershock earthquakes, tsunamis, surface faulting liquefaction, and/or landslides. For more information on these hazards, refer to Appendix A, Hazards Assessment.
- Damage assessment(s) determines the impact and magnitude of damages and should be conducted within a reasonable timeline.
- Damage assessment reports identify affected geographic area(s), which contribute to the estimated time of restoration baseline projection.
- Normal resources and processes for getting power restoration support to impacted areas may not be enough due to the severity of the earthquake.
- Earthquakes and earthquake-related hazards may present issues that may require a response by law enforcement, fire departments, electric and water/wastewater utilities, public health authorities, and environmental protection agencies. In these cases, effective interagency coordination utilizing the National Incident Management System (NIMS)/Incident Command System (ICS) is essential.
- Potential weather conditions may affect the response and restoration actions.
- Assessment, prioritizing and scheduling of repairs are conducted throughout the response and restoration process.

4 Concept of Operations

In the event of a major outage due to an earthquake or earthquake-related hazards that results in damages to LUMA facilities or the T&D System, LUMA responds and rapidly assesses the impacts and take the necessary actions to mitigate cascading effects from continual power outages and implement restoration protocols.

To facilitate response integration, the Puerto Rico Emergency Management Bureau's (PREMB) Incident Levels and LUMA's Event Classification Types are utilized and identified in the ERP – Base Plan.

4.1 LEOC Activation

The efficient activation of emergency response personnel is critical to the success of any response. An earthquake happens with little, or no warning and Puerto Rico is at risk for such emergency events. The Incident Commander (IC) is responsible for analyzing the severity, complexity, and size of the incident with the collaboration and input of the Command Staff to determine if an earthquake triggers the activation of the LUMA Emergency Operations Center (LEOC). LUMA may activate the Crisis Management Committee (CMC), Command Staff, and General Staff to support the response.

4.1.1 No-Notice Incidents

A no-notice incident occurs unexpectedly or with minimal warning. No-notice incidents do not provide emergency responders enough time to prepare for the specific event. An earthquake is an example of a no-notice incident. During a no-notice event, the determination of an Event Classification Type is typically needed before the establishment of a LEOC Activation Level. This is done by the IC once designated by the CMC.

4.2 LUMA Event Classification Types

The Event Classification Type depends upon the analysis of the expected severity and complexity of an event and is drawn from the consideration of numerous factors: The LUMA Event Classification Types and their anticipated operating conditions are described in Section 6 of the ERP and Section 7 of Annex A.

4.3 Restoration Operations

Restoration Operations conducted in response to an event impacting LUMA's distribution and transmission scheme are the responsibility of the Planning and Dispatch Team. Directives from the LEOC follow the LUMA Restoration Strategy and the Concept of Operations, both of which can be found in full in the Major Outage Restoration Annex (Annex A, Sections 6 and 7).

4.3.1 Approach

During an Earthquake, the Operations Section is responsible for safely and efficiently assessing the damage to the T&D infrastructure. To carry out this strategy, the LUMA Regional Operations Command Centers (ROCCs) report to the Division Branch Director(s) who directs the response of field teams.

The transition from response operations to restoration operations takes place during the time when (1) restoration personnel in the field can be deployed without unacceptable safety risks due to the continuation of hazardous conditions and (2) when the potential additional damage to the T&D System is low in proportion to the expected level of damage already suffered.

The start of restoration operations may be different for specific areas where the effect of the emergency caused other adverse conditions such as additional debris and limiting access to damaged areas.

When an earthquake event occurs, an effective response to restoration transition occurs with timely and accurate information is provided which includes but is not limited to the following:

- Number of clients out of service.
- Amount of damage to the T&D infrastructure.
- Labor (along with their availability) to repair the damage.

After an interruption to the T&D System and activation of the ERP, the restoration of electrical services is carried out by following four basic steps:

1. Make Safe Protocols
2. Damage Assessment (Rapid and Detailed Assessment)
3. Prioritization of Restoration
4. Execution of Tactical Restoration Operations

4.3.2 Mobilization of Personnel

Most earthquakes typically occur with little to no warning. Therefore, LUMA may be required to institute a rapid deployment of resources in the safest manner possible.

The most critical component to mobilizing personnel is the ability to be flexible to adapt to optimum levels as the threat and/or extent of damages becomes more certain.

- The IC is responsible for notifying the Command Staff of LEOC activations.
- The IC may activate other roles based on incident developments and the Event Classification Type.

- Notifications are made in accordance with the LUMA Major Outage Performance Metrics.

4.3.3 Damage Assessment

A Damage Assessment (DA) is a key component of restoration operations. Assessment personnel is managed through the Regional System Emergency Restoration Teams (SERTs) and provide their report to the Regional Commander. The order of evaluation is based on the restoration priority list.

Assessment personnel should maintain safety and security protocols when conducting DA after an earthquake in case of secondary earthquake-related hazards. Aftershocks may occur without warning up to days after the initial earthquake.

The T&D System Control Center monitors and develops an initial system status report. This report is used to compare the current level of electric demand on the system to the forecasted demand.

The DA Report is disseminated to the Operations Section in the LEOC. This report provides vital information regarding what considerations need to be taken when deciding when and where resources are needed based on priority and equipment requirements for repairs and restoration of service are identified.

4.3.4 Restoration

As outlined in Annex A, LUMA follows restoration processes safely and efficiently to repair damage and restore electrical service. Field damage assessments and repairs can begin when:

Prioritization

Outages are prioritized by:

- Considerations of safety conditions.
- Number of damages to LUMA facilities and/or infrastructure.
- Critical Community Lifelines, customer type, and the number of affected customers.
 - LUMA identifies a summary of Major Outage Event Performance Metrics located within the ERP, Annex A.

4.3.5 Emergency Earthquake Event Conditions

The Restoration Priority Matrix and Critical Facility Level protocols are consistent in both normal and emergency operations for any type of event. Municipal emergency response resources, such as law enforcement and/or fire departments, that respond to the incident should provide LUMA with the status of the area/facility before a damage assessment can be conducted.

LUMA's facilities and infrastructure damages are assessed by conducting a damage assessment. LUMA's restoration efforts focus on the prioritization objectives listed below including, but not limited to the following:

- Responding with appropriate resources to address emergency and life-threatening conditions regarding electrical services.
- Restoration to affected Critical Community Lifelines as outlined in Annex A.
- Disseminate timely and accurate communications of system conditions.

4.3.6 Make Safe Protocols

During a minor or major event, the number of resources that are trained and readily available may be limited, and the demand could greatly exceed those available. LUMA ensures “make safe” actions are taken and acknowledges it may be necessary to contract additional resources to support make safe and restoration activities.

5 Estimated Time of Restoration

Earthquake damages that cause the electric system to fail and considerations regarding earthquake-related hazards(s) which may impede restoration operations must be investigated upon notification of an impending or immediate emergency event. The timespan of an earthquake may prolong the Estimated Times of Restoration (ETR), given aftershocks and other earthquake-related hazards can occur after the initial event. Providing an accurate ETR is a top priority of LUMA's overall restoration process.

The flexibility of an event requires a strategic, deliberate, planning-oriented posture which allows a utility to plan resource needs, operational periods, strategic objectives, staff fatigue, and external communications. The expected actions related to ETRs are found in Annex A of the ERP, Section 8.

6 Organization

This section describes the key functions of the various components and positions of the organizational structure. An orderly and consistent flow of information between operations, communications, logistics, and partner support organizations is necessary in times of emergency outage events. LUMA has seven Emergency Operations Centers: the LEOC and six ROCCs. The organizational charts indicating the lines of authority and the interrelationship between the organizational groups can be found in Appendix A of the Major Outage Restoration Annex (Annex A).

6.1 LUMA Leadership

Following an earthquake, LUMA leadership maintains an ongoing and open dialogue to discuss and share information about the impact on the T&D System. This dialogue ensures full situational awareness among leadership teams and provides a platform to facilitate discussions on the possible exchange of staff resources and other support functions between entities.

This approach provides the mechanism for consistent messages to employees, customers, and other external stakeholders. Following an earthquake or earthquake-related hazard(s), the LUMA leadership team and the CMC activate the applicable functional areas as needed.

6.2 Emergency Response Organization

The organizational structure of LUMA during outage restoration can be found in Appendix A of Annex A. Refer to the LUMA ERP – Base Plan for a list of roles and responsibilities.

7 Direction, Control, and Coordination

Annex C provides the framework for the systematic response when earthquake emergencies arise and emergency restoration operations are required. Determination of an appropriate response is based on multiple factors which include:

- Damage Assessments
- Determination of the Event Type
- Coordinated response utilizing the ICS

The ERP identifies the framework to respond to and recover from natural or man-made events. For additional information related to direction, control, and coordination, refer to the ERP – Base Plan, Section 8.

8 Communications

LUMA provides timely, accurate, and consistent communications following an earthquake. Emergency communications may include alerts and warnings from verified emergency notifications. Communications may include information about protective measures, LUMA response and restoration status, available assistance, and other matters affecting LUMA's response and recovery.

The LUMA PIO communicates timely and accurate information. LUMA communicates information through a variety of methods, including but not limited to the following:

- LUMA website and customer outage map
- News media
- Social messaging including the use of Twitter, Facebook, and, WhatsApp, among others

LUMA has established a consistent messaging platform that is flexible enough to allow for internal or external expansion, depending on the Event Classification Type. Refer to Appendix A of the ERP – Base Plan.

9 Demobilization

The IC has the responsibility to initiate the De-escalation/Demobilization process. Demobilization is the orderly, safe, and efficient return of operations, facilities, and resources to their pre-event status. Demobilization planning is an on-going process that facilitates accountability and ensures efficient resource management.

Tracking resource requirements and releasing those resources that are no longer required to support the response is essential for accountability and managing incident control. This assists in reducing the loss of resources, operating costs, and ensuring retention and availability of resources for other activities and assignments as needed.

The Planning and Intelligence Section Chief (PSC) develops demobilization plans and ensure they are implemented as instructed by the IC.

The emergency response operations may be fully demobilized when:

- All event-related jobs are assigned.
- Centralized Dispatch is managing the event.
- All non-regional crews are released.

10 Training and Exercises

The successful response to emergency events requires a Company-wide commitment to preparedness integrated into LUMA's daily operations, not just during emergency events. Emergency preparedness activities can include planning, training, and participating in exercises; attending meetings with public safety officials, The Crisis Management Department staff, and PREMB personnel; and maintaining updated contact information of personnel and organizations that may assist in LUMA's restoration efforts. Every employee is expected to participate in preparedness activities throughout the year.

The Crisis Management Department maintains the ERP-related training database and coordinates ERP role-related training. Training, drills, and exercises are designed and conducted to develop and improve the knowledge and skills of personnel assigned to emergency response activities and to support the safe and reasonably prompt completion of all required actions during ERP activations.

The LUMA exercise program is consistent with the Homeland Security Exercise Evaluation Program (HSEEP) developed by the Federal Emergency Management Agency (FEMA). The HSEEP methodology is defined and implemented using seven exercise types, broken into the categories of discussion-based exercises and operations-based exercises. LUMA employs a variety of these exercise types based on the exercise goals and objectives. The goal of conducting exercises is to enhance training, improve familiarization, evaluate and/or validate plans, policies, and procedures, increase capabilities, and practice skills in a no-fault, risk-free environment.

11 Annex Development and Maintenance

This Annex is a living document. Development and maintenance of this Annex are in conjunction with the ERP – Base Plan. Proposed changes should be sent to the Crisis Management Department for approval and inclusion.

Please reference the ERP – Base Plan, Section 13, Plan Development and Maintenance, for additional information.

12 Explanation of Terms

12.1 Acronyms

CMC	Crisis Management Committee
DA	Damage Assessment
EOC	Emergency Operations Center
ERO	Emergency Response Organization
ERP	Emergency Response Plan
ETR	Estimated Time of Restoration
FEMA	Federal Emergency Management Agency
HSEEP	Homeland Security Exercise Evaluation Program
IC	Incident Commander
ICS	Incident Command System
LEOC	LUMA Emergency Operations Center
NIMS	National Incident Management System
OMS	Outage Management System
PIO	Public Information Officer
PREMB	Puerto Rico Emergency Management Bureau
PSC	Planning and Intelligence Section Chief
ROCC	Regional Operations Command Center
SERT	System Emergency Restoration Team
T&D	Transmission & Distribution
SERT	System Emergency Restoration Team

12.2 Terms

Assumptions – Operationally relevant parameters expected and used as a context, basis, or requirement for the development of response and recovery plans, processes, and procedures.

Damage Assessment – A mechanism utilized to determine the magnitude of damage and impact of disasters.

Demobilization – The ongoing process of disengaging response resources as incident objectives are met and returning them to their normal function.

Disaster – An occurrence of a natural catastrophe, technological accident, or human-caused event that has resulted in severe property damage, deaths, and/or multiple injuries and exceeds the response capability of the local jurisdiction and requires the Government of Puerto Rico, and potentially Federal, involvement.

Emergency or Emergency Event – Any outage event, as per the T&D OMA; declared emergency or major disaster; or event, whether natural or manmade, that requires responsive action to protect life, property, and/or operational capacity where LUMA has deemed it an Emergency and/or necessary to activate the LUMA Emergency Operations Center.

Earthquake – A term used to describe both sudden slips on a fault and the resulting ground shaking and radiated seismic energy caused by the slip or other sudden stress changes in the earth.

Earthquake Aftershock – Shaking of the earth's surface caused by lower magnitude tremors that follow the principal earthquake.

Earthquake Related Hazards- Secondary hazards triggered by the initial earthquake. This includes but is not limited to earthquake aftershocks, tsunamis, liquefaction, surface faulting and landslides.

Emergency or Emergency Event – Any outage event, as per the T&D OMA; declared emergency or major disaster; or event, whether natural or manmade, that requires responsive action to protect life, property, and/or operational capacity where LUMA has deemed it an Emergency and/or necessary to activate the LUMA Emergency Operations Center.

Emergency Operations Center – The physical locations at which coordination of information and resources to support incident management activities occurs.

Emergency Response Organization – A structured organization with overall identified responsibilities for initial and ongoing emergency response and mitigation.

Incident Action Plan – Includes the overall incident objectives and strategies established by the Incident Commander. The Planning Section is responsible for developing and documenting the IAP.

Incident Commander – The individual appointed by the Company's executive management to have overall responsibility for LUMA's response during an Emergency Event.

Incident Command System - Coordinated and collaborative incident management construct specifically designed and made a part of the National Incident Management System ("NIMS") under the Federal Emergency Management Agency ("FEMA").

Joint Information Center – A central point of contact for new media and interest parties to coordinate incident information activities.

Landslides – The movement of surface material down a slope that may be triggered by weather or earthquakes.

Surface Faulting – An offset of the ground surface when fault rupture extends to the Earth's surface.

System Level ERO – Multi-regional Emergency Response Organization

Appendix A – Hazards Assessment

Puerto Rico experiences frequent earthquakes due to the many geological faults that surround and cross over the island, as shown in Figure 3, below. Earthquakes occur when two blocks of earth, known as geological faults, suddenly slip past one another causing a release of energy and seismic waves. Seismic waves shake the earth's crust and may cause a significant amount of damage to roads, infrastructure, buildings, and nature. Earthquakes' widespread impact and high magnitude can trigger a variety of hazards. When planning for an earthquake, there are a variety of hazards that should be taken into consideration.

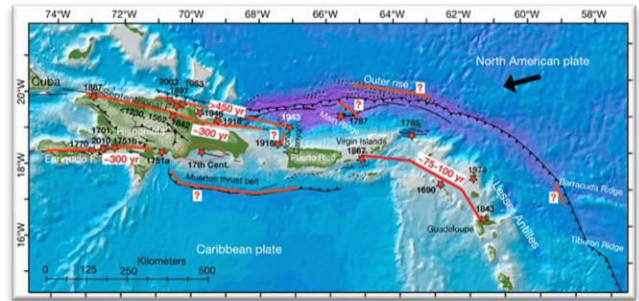


Figure 3: Puerto Rico fault lines

Earthquake Aftershocks

Aftershocks are typically lower-magnitude earthquakes that occur after the main shock of a larger earthquake. They occur near the epicenter of the original earthquake or along the fault line that caused the primary quake. In many cases, they can be large enough to hamper emergency response efforts by destabilizing infrastructure and potentially causing additional stress to individuals coping with damage from the original quake. Aftershocks decrease in magnitude and frequency over time and generally are most severe in the hours and days following the primary quake.

Surface Faulting

Surface faulting is the displacement that reaches the earth's surface during a slip along a fault. It commonly occurs with shallow earthquakes, with an epicenter less than 20 km. Surface faulting can leave a visible line in the ground, noting the shift in the fault location, and can have a dramatic effect on the local infrastructure.

Landslides

A landslide is a movement of surface material down a slope. Earthquake-induced landslides are a result of the ground shaking and fault movement of an earthquake, which can potentially have a catastrophic impact on infrastructure. Landslides can include a large area of land, or surface movement that builds as it moves down the slope, both having the ability to cause significant destruction.

Tsunami

A tsunami is a sea wave of local or distant origin that results from large-scale seafloor displacements associated with large earthquakes and has the potential to cause significant damage to the coastal areas. Tsunami waves in the Puerto Rico region could have an average height of 30 feet. A tsunami on the northern coast of the island could affect the Central San Juan, Palo Seco, and Cambalache power plants. A tsunami on the southern coast of the island could affect Costa Sur, Central Aguirre, AES, and EcoEléctrica.



Emergency Response Plan

Annex D – Severe Weather

LUMA ENERGY

CRISIS MANAGEMENT

May 27, 2022

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1 Purpose

The purpose of LUMA's Storm and Hurricane Response Annex (Annex D) is to establish a comprehensive operational and tactical framework to respond to major outage restoration events caused by the effects of severe weather. The Annex defines the operational roles and responsibilities of the LUMA Crisis Management Committee (CMC) and LUMA Emergency Operations Center (LEOC) before, during, and after severe weather. This annex assists the LUMA Emergency Response Organization (ERO) in taking the necessary actions to protect the safety, maintain continuity of service, and protect lives and property. It also provides the Puerto Rico Energy Bureau (PREB), the Puerto Rico Public-Private Partnerships Authority (P3A), the Department of Economic Development and Commerce (DEDC), the Negotiated for Emergency Management and Disaster Management (NMEAD), and other agencies with guidance on how LUMA responds to and prioritizes power outages with the general principles of Community Lifelines. This Annex helps define the operational, logistical, and administrative procedures carried out before, during, and after Puerto Rico and the Transmission and Distribution System (T&D System) are impacted by severe weather.

2 Scope

This Annex applies to emergency outage events caused by severe weather and related hazards that result in, or could result in, a major impact to the integrity of the T&D System and/or a disruption of electrical service to LUMA customers. Execution of coordinated decisions, appropriate responses, and actions to activate resources contributes to a rapid and safe recovery and depends upon the scalability of this Annex.

3 Situations and Assumptions

3.1 Situation

Severe weather poses a threat to life and property. A major severe weather incident is likely to have significant impacts on the T&D System. Puerto Rico is vulnerable to a variety of severe weather incidents such as hurricanes and tropical storms, flooding, storm surge, thunderstorms, heavy rain, landslides, lightning, windstorms, wildfires, hailstorms, and tornadoes.

On September 20, 2017, Hurricane Maria entered the southeastern part of Puerto Rico and crossed the entire island with winds of 155 mph and exited via the northwestern coast, leaving unprecedented catastrophic damage throughout the island. This hurricane caused very serious damage to the the T&D System, causing a total blackout and collapse of communications.

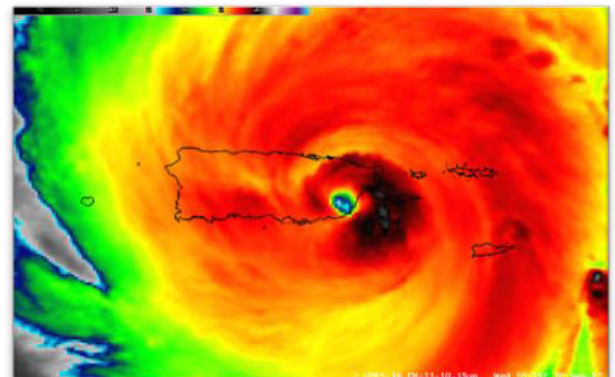


Figure 1: Hurricane Maria making landfall in Puerto Rico

The efficiency of this Annex is based on LUMA's commitment to prepare and implement the procedures described in this Annex and the Emergency Response Plan (ERP) – Base Plan. Executing the appropriate responses to affect fast and secure recovery depends on the scalability of the Annex. The number of clients affected, and the magnitude of a major outage event vary, but the operating concept remains the same.

LUMA takes a proactive approach to strengthen the T&D System throughout Puerto Rico, to withstand major weather events. Because of this, major hurricanes like Maria are less impactful for the T&D System that supplies power to LUMA customers and critical areas. Due to the configuration of Puerto Rico's T&D grid and the location of generation, LUMA focuses on strengthening critical T&D lines to distribute power to key load centers as well as the reconstruction of critical system substations.

3.2 Assumptions and Considerations

The ERP - Base Plan, Section 4, describes the general assumptions and considerations. Identified below are additional assumptions and considerations regarding response to severe weather which should include, but are not limited to the following:

- Puerto Rico is highly vulnerable to the dangers posed by storms and hurricanes which negatively affect the T&D System infrastructure that LUMA operates.
- Severe weather can occur at any time of the day or night, on weekends or holidays, with little or no warning.
- The succession of events in an emergency or disaster is not predictable.
- Operational plans may require modifications to meet the requirements of the incident at hand.
- Severe weather can involve high winds and rain, creating an environment for flooding and landslides. For more information on these hazards, refer to the Hazards Assessment (Appendix A).
- An emergency may be declared in advance of an impact if the information indicates that such conditions are developing or are probable.
- Weather conditions (i.e., impassable roads, downed communication systems) may hinder the response and restoration actions
- LUMA has a duty and responsibility to maintain, distribute and implement the ERP.
- The response to the negative effects of severe weather should be guided by the principles of the National Response Framework (NRF), National Incident Management System (NIMS) and the Incident Command System (ICS).
- The impact of emergency events on the energy infrastructure operated by LUMA depends on the extent of the severity of the damage.
- Assessment, prioritizing and scheduling of repairs are conducted throughout the response and restoration process.

4 Concept of Operations

In the event of interruptions due to a storm or hurricane that results in or may result in damage to facilities or power outages, LUMA promptly assesses the impacts on the T&D infrastructure and take the necessary steps to mitigate the cascading effects of the ongoing power outages and implement restoration protocols. To ensure the integration of response, the incident response levels of the Puerto Rico Emergency Management Bureau (PREMB), and the LUMA event classification types are identified in the ERP - Base Plan.

During a severe weather event, that is forecasted as a potential incident (i.e., a hurricane), a LEOC Activation Level is chosen before an Event Classification Type.

4.1 LEOC Activation

The efficient activation of emergency response personnel is critical to the success of any response. Storms and hurricanes can affect LUMA operations outside daily blue skies operational boundaries. The Incident Commander (IC) is responsible for analyzing the severity, complexity, and size of the incident with the collaboration and input of the Command Staff to determine if the severe weather event triggers the activation of the LEOC. LUMA may activate the CMC, Command Staff, and General Staff island-wide to support the response in preparation for the severe weather event.

4.1.1 Forecasted Potential Incidents vs. No-Notice Incidents

The process of determining the LEOC Activation Level and/or an Event Classification Type may be dependent on what triggers the activation: a forecasted potential incident or a no-notice incident. See Appendix A of the ERP – Base Plan for the LEOC Activation Chart and the Event Classification Chart, respectively.

Forecasted Potential Incidents and Scheduled Events

Forecasted potential incidents allow for a preparedness window before the incident to posture the organization for a response. Commonly, these incidents are atmospheric and forecasted (i.e., hurricanes). For these types of incidents, the LEOC Activation Level should be assigned first, followed by assigning an Event Classification Type, if required. For a hurricane, an Event Classification Type may be designated once the incident starts to negatively affect any part of the T&D System.

No-Notice Incidents

A no-notice incident occurs unexpectedly or with minimal warning. No-notice incidents do not provide emergency responders sufficient time to prepare for the specific event. The determination of an Event Classification Type is typically needed before the establishment of the LEOC Activation Level during a no-notice event.

During a no-notice event, the determination of an Event Classification Type is typically needed before the establishment of a LEOC Activation Level.

4.2 LUMA Event Classification Types

The Event Classification Type depends upon the analysis of the expected severity and complexity of an event and is drawn from the consideration of numerous factors: The LUMA Event Classification Types and their anticipated operating conditions are described in Section 6 of the ERP – Base Plan and Section 7 of Annex A.

4.3 Restoration Operations

Restoration Operations conducted in response to an event impacting LUMA's distribution and transmission scheme are the responsibility of the Planning and Dispatch Team. Directives from the LEOC follow the LUMA Restoration Strategy and the Concept of Operations, both of which can be found in full in the Major Outage Restoration Annex (Annex A, Sections 6 and 7).

4.3.1 Approach

During an emergency, the Operations Section is responsible for safely and efficiently assessing the damage to the T&D infrastructure. To carry out this strategy, the LUMA Regional Operations Command Centers (ROCCs) report to the Division Branch Director(s) who directs the response of field teams.

The transition from response operations to restoration operations takes place during the time when (1) restoration personnel in the field can be deployed without unacceptable safety risks due to the continuation of hazardous conditions and (2) when the potential additional damage to the T&D System is low in proportion to the expected level of damage already suffered.

The start of restoration operations may be different for specific areas where the effect of the emergency caused other adverse conditions such as additional debris and limiting access to damaged areas.

After the passage of a storm or hurricane, three important pieces of information must be collected to allow for an effective restoration:

- Number of clients out of service.
- Amount of damage to the T&D infrastructure.
- Labor (along with their availability) to repair the damage.

After an interruption to the T&D System and activation of the ERP, the restoration of electrical services is carried out by following four basic steps:

1. Make Safe Protocols
2. Damage Assessment (Rapid and Detailed Assessment)
3. Prioritization of Restoration
4. Execution of Tactical Restoration Operations:

4.3.2 Mobilization of Personnel

When the threat of a storm or hurricane is imminent, preventive deployment of personnel can facilitate a rapid response. The most critical component is the ability to be flexible, expanding and retracting to optimal levels as the threat becomes more secure. An anticipated major outage requires an appropriate mobilization of personnel to respond to and recover from a storm or hurricane in an efficient and timely manner.

- The IC is responsible for notifying the Command Staff of LEOC activations.
- The IC may activate other roles based on incident developments and the Event Classification Type.
- Notifications are made in accordance with the LUMA Major Outage Performance Metrics.

4.3.3 Damage Assessment

A Damage Assessment (DA) is a key component of restoration operations. The DA process utilizes “two-person” teams, or additional support as needed, to physically inspect and report overhead primary and secondary damage locations associated with each locked-out circuit. Assessment personnel is managed through the Regional System Emergency Restoration Team (SERT) and provide their report to the Regional Commander. The order of evaluation is based on the restoration priority list.

Post-event, the T&D System Control Center monitors and develops an initial system status report. This report is used to compare the current level of power demand on the system to the forecasted demand.

The DA report is disseminated to the Operations Section in the LEOC, where resources and equipment requirements to make the repairs and restore services are identified. Additional information on specific DA protocols is in development.

4.3.4 Restoration

LUMA follows restoration processes safely and efficiently to repair damage and restore electrical service. These restoration protocols are designed to restore power to as many customers as possible, in the shortest possible time, and the safest manner possible.

Field damage assessments and repairs can begin when:

- Field personnel can be deployed without safety hazards or dangerous conditions.
- The potential of additional damage to the electric system is low.

Prioritization

Outages are prioritized for considerations of security conditions, type, and amount of damage to the system, community lifelines, type of customer, and the number of customers affected. LUMA focuses restoration efforts on restoring service to critical facilities such as hospitals, police departments, fire departments, and other public health and safety facilities as a matter of priority, as warranted. LUMA must make prudent decisions that have the greatest benefit to the overall stability of the T&D System and the greatest benefit to all customers.

Priority restoration cannot be guaranteed; therefore, LUMA implements specific communication outreach programs to critical facilities, municipal governments, and key account customers to alert them to prepare for potential prolonged power outages adequately, and to provide information and updates on LUMA's preparedness and restoration activities.

LUMA must assess emergency and life-threatening conditions (public safety hazards, downed wires reported by emergency services) before restoration efforts can begin.

Situational Assessment

LUMA completes an evaluation of the system through the Supervisory Control and Data Acquisition System (SCADA), Outage Management System (OMS), and reported outages from LUMA customers. When a type of event classification has been determined, staff are assigned according to the structure of the LUMA identifiers.

Please refer to Section 7 of Annex A for how activities are assigned, evaluations documented, repairs made, and service restored.

5 Estimated Time of Restoration

Potential damages from severe weather, that could cause the power grid to fail must be investigated upon notification of an impending emergency. Consideration must be given to severe weather hazards before an Estimated Time of Restoration (ETR) is given. The lifespan of a storm may prolong the ETR given the unpredictable nature of these phenomena.

Subsequently, timely and accurate ETR must be provided to all LUMA customers and stakeholders. Providing an accurate ETR is a top priority of LUMA's overall restoration process.

The flexibility of an event requires a strategic, deliberate, planning-oriented posture which allows a utility to plan resource needs, operational periods, strategic objectives, staff fatigue, and external communications. The expected actions related to ETRs are found in Annex A of the ERP, Section 8.

6 Organization

This section describes the key functions of the various components and positions of the organizational structure. An orderly and consistent flow of information between operations, communications, logistics, and partner support organizations is necessary in times of emergency events. LUMA has seven Emergency Operations Centers: the LEOC and six ROCCs. The organizational charts indicating the lines of authority and the interrelationship between the organizational groups can be found in Appendix A of the Major Outage Restoration Annex (Annex A).

6.1 LUMA Leadership

Before and during major storm and hurricane events, LUMA leadership maintains an ongoing and open dialogue to discuss and share information about an impending emergency event that may affect the power grid. This proactive dialogue ensures full situational awareness among leadership teams and provides a platform to facilitate discussions on the possible exchange of staff resources and other support functions between entities.

This approach provides the mechanism for consistent messages to employees, customers, and other external stakeholders. With the threat of a major weather event or another emergency, the LUMA leadership team and the CMC activate the applicable functional areas.

6.2 Emergency Response Organization

The organizational structure of LUMA during the restoration of the outage can be found in Appendix A of Annex A. Refer to the LUMA ERP – Base Plan for a list of roles and responsibilities.

7 Direction, Control, and Coordination

This annex provides the framework for systematic response when severe weather emergencies arise, and emergency restoration operations are required. Determining an appropriate response is based on multiple factors including:

- Damage assessments
- Determining the type of event
- Coordinated response using the ICS

The ERP, annexes, and appendices identify the framework for responding to, and recovering from, natural or man-made events. For additional information related to direction, control, and coordination, see the ERP – Base Plan, Section 8.

8 Communications

LUMA provides timely, accurate, and consistent communications before, during, and following a severe weather event. Emergency communications may include alerts and warnings from verified emergency notifications. Communications may include information about protective measures, LUMA response and restoration status, available assistance, and other matters affecting LUMA's response and recovery.

The LUMA PIO communicates timely and accurate information. LUMA communicates information through a variety of methods, including but not limited to the following:

- LUMA website and customer outage map
- News media
- Social messaging including the use of Twitter, Facebook, and, WhatsApp, among others

LUMA has established a consistent messaging platform that is flexible enough to allow for internal or external expansion, depending on the LEOC Activation Level and Event Classification Type.

9 Demobilization

Demobilization is the orderly, safe, and efficient return of an incident resource to its original location and/or state. The IC is responsible for initiating the demobilization process. Demobilization planning is an ongoing process that begins as soon as the response begins. This facilitates accountability to ensure efficient resource management.

Tracking resource requirements and releasing them when no longer needed to support the response is essential for accountability. This helps reduce resource loss, reduce operating costs, and ensures that resources are available for other activities and assignments as needed.

The Planning and Intelligence Section Chief (PSC) develops demobilization plans and ensures they are implemented as instructed by the IC. The emergency response operations can be completely demobilized when:

1. All jobs related to the storm or hurricane are reassigned.
2. Centralized Dispatch is managing events.
3. All non-regional teams are dispatched (released).

10 Training and Exercises

The successful response to emergency events requires a Company-wide commitment to preparedness that is integrated into LUMA daily operations, not just during emergency events. Emergency preparedness activities can include planning, training, and participating in exercises; attending meetings with public safety officials, The Crisis Management Department staff, and PREMB personnel; and maintaining updated contact information of personnel and organizations that may assist in LUMA's restoration efforts. Every employee is expected to participate in preparedness activities throughout the year.

The Crisis Management Department maintains the ERP-related training database and coordinates ERP role-related training. Training, drills, and exercises are designed and conducted to develop and improve the knowledge and skills of personnel assigned to emergency response activities, and to support the safe and reasonably prompt completion of all required actions during ERP activations.

The LUMA exercise program follows guidelines from the Homeland Security Exercise Evaluation Program (HSEEP) developed by the Federal Emergency Management Agency (FEMA). The HSEEP methodology is defined and implemented using seven exercise types, broken into the categories of discussion-based exercises and operations-based exercises. LUMA employs a variety of these exercise types based on the exercise goals and objectives. The goal of conducting exercises is to enhance training, improve familiarization, evaluate and/or validate plans, policies, and procedures, increase capabilities, and practice skills in a no-fault, risk-free environment.

11 Annex Development and Maintenance

This Annex is a living document. Development and maintenance of this Annex are in conjunction with the LUMA ERP – Base Plan. Proposed changes should be sent to the Crisis Management Department for approval and inclusion.

Please reference the LUMA ERP – Base Plan, Section 13, Plan Development and Maintenance for additional information.

12 Explanation of Terms

12.1 Acronyms

CMC	Crisis Management Committee
COML	Communications Unit Leader
DA	Damage Assessment
DEDC	Department of Economic Development and Commerce
EOC	Emergency Operations Center
ERO	Emergency Response Organization
ERP	Emergency Response Plan
ETR	Estimated Time of Restoration
FACL	Facilities Unit Leader
FEMA	Federal Emergency Management Agency
FSC	Finance/Administration Section Chief
HSEEP	Homeland Security Exercise Evaluation Program
IC	Incident Commander
ICS	Incident Command System
JIC	Joint Information Center
LEOC	LUMA Emergency Operations Center
LNO	Liaison Officer
LSC	Logistics Section Chief
NIMS	National Incident Management System
NMEAD	Negotiated for Emergency Management and Disaster Management
NRF	National Response Framework
NWS	National Weather Service
OMS	Outage Management System
OSC	Operations Section Chief
P3A	Puerto Rico Public-Private Partnerships Authority
PIO	Public Information Officer
PREB	Puerto Rico Energy Bureau
PREMB	Puerto Rico Emergency Management Bureau
PSC	Planning and Intelligence Section Chief
REGS	Regulatory Reporting Specialist
RESL	Resources Unit Leader
ROC	Regional Operations Center
SCADA	Supervisory Control and Data Acquisition
SERT	System Emergency Restoration Team
SITL	Situation and Intelligence Unit Leader
SOFR	Safety Officer
T&D	Transmission and Distribution
TRUL	Transportation/Fleet Unit Leader

12.2 Terms

Atmospheric Disturbance - Area of bad weather, usually accompanied by heavy rains and winds.

Bulletin - Information message issued by the National Weather Service of Puerto Rico.

Emergency or Emergency Event – Any outage event, as per the T&D OMA; declared emergency or major disaster; or event, whether natural or manmade, that requires responsive action to protect life, property, and/or operational capacity where LUMA has deemed it an Emergency and/or necessary to activate the LUMA Emergency Operations Center.

Flash Flood - Flash floods are the result of intense storms dropping large amounts of rain within a short period of time or dam failures. Flash floods occur with little or no warning and can reach a full peak in only a few minutes.

Flood Warning - Is a forecast of impending floods advising of the expected severity of flooding (minor, moderate, or major), the affected river or body of water, and when and where flooding will begin.

Fujita - Pearson Tornado Scale - A descriptive scale categorizing tornadoes by intensity, relating intensity to damage potential.

Hurricane - Storm with a defined circulation and intensity in which sustained winds reach or exceed 74 miles per hour.

Hurricane, Storm or Tropical Depression Warning - Statement transmitted when a hurricane, storm or tropical depression is expected to hit an area within the next 24 hours.

Hurricane, Storm or Tropical Depression Watch - Statement transmitted when the hurricane, storm or tropical depression approaches and threatens specific coastal areas or locations in the next 36 hours or less

Imminence of Hurricane, Storm or Tropical Depression - Indicates that the hurricane, storm or tropical depression will hit Puerto Rico.

Severe Thunderstorm Warning - Issued by the National Weather Service when a severe thunderstorm has been sighted or indicated by weather radar.

Severe Thunderstorm Watch - Issued by the National Weather Service when the weather conditions are such that a severe storm (damaging winds 58 miles per hour or more, or hail 3/4 of an inch in diameter or greater) is likely to develop.

Tropical Cyclone - Includes hurricanes, tropical storms, and tropical depressions. These storms are born in the tropical and subtropical Atlantic Ocean including the Caribbean Sea and the Gulf of Mexico. Tropical cyclones are classified mainly by wind speed.

Tropical Depression - A tropical low-pressure system where the maximum sustained surface wind (1-minute mean) is 33 knots (38 mph) or less.

Tropical Disturbance - Organized convection originating in the tropics/sub-tropics with a non-frontal migratory character, sustained for twenty-four hours or more.

Tropical Storm Warning - A warning that tropical storm conditions are expected in a specified area within twenty-four hours.

Tropical Storm Watch - Tropical storm conditions pose a threat to a specified area generally within thirty-six hours.

Tropical Storm - A tropical low-pressure system in which the maximum sustained surface wind (1-minute mean) ranges from 34 to 63 knots (39 to 73 mph).

Warning - Issued to forewarn an event that is imminent or has a high probability of occurring.

Watch - Term used as an alerting procedure for an event that may occur.

Wind Chill - Wind chill is a term used to describe the rate of heat loss on the human body resulting from the combined effect of low temperature and wind. As winds increase, heat is carried away from the body at a faster rate, driving down both the skin temperature and eventually the internal body temperature.

Appendix A – Hazards Assessment

Puerto Rico is in the path of storms and hurricanes, which develop in the Atlantic, crossing the Caribbean, and many affect the United States. Hurricane season begins on June 1 and ends on November 30 of each year. Hurricanes and tropical cyclones have historically caused the most damage and loss of life in Puerto Rico.

Hurricanes are tropical cyclones that develop in the tropics. Tropical cyclones can be defined as a closed circulation that develops around a center of low pressure in which winds rotate counterclockwise in the northern hemisphere. Hurricanes, tropical cyclones, and rainstorms can create a variety of hazards.

Saffir-Simpson Scale

The Saffir-Simpson hurricane wind scale establishes categories from 1 to 5 according to the intensity of the hurricane. The scale provides examples in the United States of the different types of damage and impacts caused by winds depending on their intensity. The maximum wind speed on the surface is expressed by one (1) minute of sustained wind at the standard observation base of 33 feet over unobstructed areas.

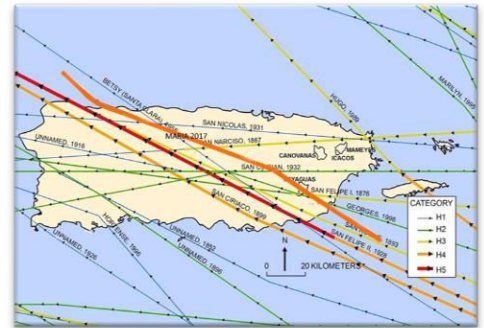


Figure 2: Hurricane trajectories through Puerto Rico

Category	Winds (mph)	Damage
1	74-95	Some damage: Large branches of trees will snap, and shallowly rooted trees may be toppled. Extensive damage to power lines and poles likely will result in power outages that could last a few to several days.
2	96-110	Extensive damage: Moderate- Power outages and blackouts are expected to last several days or weeks. The supply of drinking water could be scarce due to the failure of filtration systems.
3 (major)	111-129	Devastating damage: Water and electricity may become scarce for several days or weeks after the storm passes.
4 (major)	130-156	Catastrophic damage: Blackouts can last for weeks and even months. In the long run, the shortage of safe drinking water will increase human suffering. Many places in the area will remain uninhabitable for weeks and months.
5 (major)	> 157	Catastrophic damage: Blackouts can last for weeks and even months. The scarcity of safe drinking water will increase human suffering. Many places in the area will remain uninhabitable for weeks and months.

Table 1: Saffir-Simpson Scale description

High Winds

A tropical cyclone can produce winds of more than 157 miles per hour. Hurricane-force winds can damage the distribution and transmission grid, buildings, and destroy mobile homes and other properties. Debris such as signs, roofing, siding, and other items becomes airborne debris, causing additional injuries from hurricane damage. In addition, high-rise buildings deserve special consideration; wind pressures in the upper portions of high structures can be much higher than those on the ground floor. High-rise bridges in the areas become particularly vulnerable to strong winds. Not only could they experience wind-related structural problems, but they could also affect evacuation times. Winds are the biggest cause of material damage to the interior of the coast.

Thunderstorms and Floods

Annual precipitation for Puerto Rico ranges from 172 inches near El Yunque National Forest (located in the Sierra de Luquillo mountains) in the eastern part of the island to less than 30 inches at Ponce in the southwest. Much of the rainfall in the wet season (May through October) derives from tropical cyclones (hurricanes and tropical storms) and easterly waves, which move from east to west, while high sea surface temperatures can also trigger local thunderstorm activity. In the dry season (November through April), rainfall is caused by cold fronts moving from west to east.

Due to Puerto Rico's geography, rains cause runoff that can quickly cause unexpected flooding by rivers, streams, or storm surges when atmospheric phenomena arrive. These floods can cause serious damage to critical infrastructure and property and cause loss of life.

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Jan	5.21	1.54	3.08	1.91	1.97	3.58	2.52	3.48	4.36	2.66
Feb	2.75	2.26	3.17	1.53	2.44	4.15	4.01	1.56	4.24	2.33
Mar	2.73	2.98	9.19	3.87	1.81	2.71	3.81	6.22	3.78	3.58
Apr	5.50	4.82	5.98	4.89	4.09	3.33	6.39	8.02	5.34	4.02
May	10.89	13.90	8.39	11.40	6.80	4.15	6.36	6.41	6.64	5.94
Jun	8.65	8.42	1.68	6.40	1.66	2.39	4.75	5.52	4.15	3.20
Jul	9.81	10.00	6.00	7.25	3.46	2.35	6.59	7.11	3.69	6.50
Aug	7.83	16.43	8.13	6.57	12.12	6.00	7.78	8.43	8.20	6.36
Sep	7.33	10.69	3.97	7.72	7.22	6.07	6.03	12.98	6.12	8.56
Oct	11.95	5.71	9.07	6.90	4.26	7.44	10.33	11.27	7.57	7.35
Nov	6.12	7.77	5.96	6.84	8.47	6.81	11.79	6.74	5.69	4.35
Dec	4.74	4.03	3.64	5.86	4.17	2.66	3.85	3.21	2.30	2.84
Annual	83.51	88.55	68.26	71.14	58.47	51.64	74.21	80.95	62.08	57.69

Figure 4: Annual yearly precipitation in Puerto Rico (2010-2020)

Landslides

Landslides include all movements of soil, rock, or debris because of falling, sliding, or flowing. The triggering cause may be heavy rainfall or seismic activity. An untimely occurrence of a large earthquake during or soon after a sustained period of moderate to heavy rainfall could produce a landslide problem of monumental proportions. Large landslides across the island can happen, isolating communities, delaying response activities, limiting the provision of essential community services (Community Lifelines), and the restoration of the electricity transmission and distribution system.

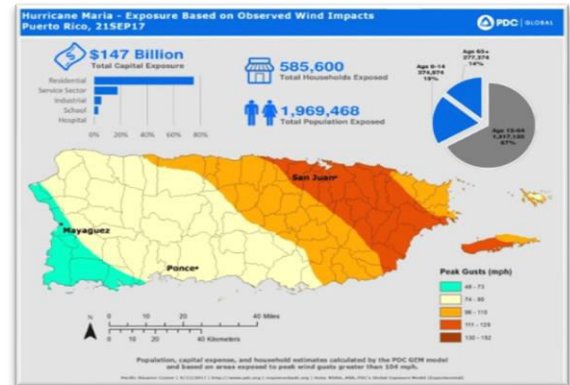


Figure 3: Hurricane Maria - exposure based on observed wind impacts

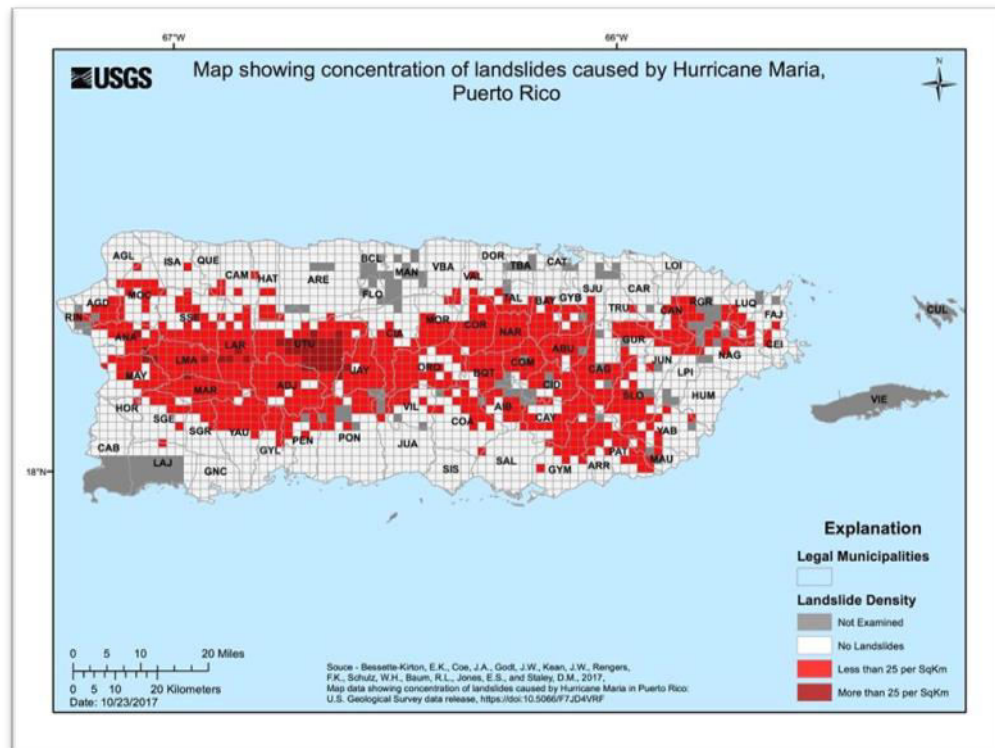


Figure 5: Concentration of landslides caused by Hurricane Maria

Appendix B – H-120 Timeline

Note that the below table is to be used as a guide only and can be adapted based on projected impacts of the storm.

Section	Group/Unit	Task
Pre-storm – 136 hours		
CM	CM	Coordinate with the Puerto Rico National Weather Service (NWS) regarding potential tropical weather threats.
CM	CM	Brief chief executive and the CMC chair after receipt of weather advisories, as required.
CM	CM	Request IT to conduct equipment readiness within the LEOC; including alternate location(s) to include radios, telephones, and laptops.
CM	CM	The LUMA CEO considers activating the LUMA Emergency Response Organization (ERO).
CM	CM	Activate the Crisis Management Committee (CMC) based on the potential effects on the T&D System Operations.
CM	CM	The LUMA CEO and the Incident Commander (IC) determine the LUMA Event Classification Type and affects the incident may or will have on the T&D Operations.
Pre-Storm - 120 hours - 5 Days Continue actions from the previous operational period as needed.		
CM	CM	Monitor the National Hurricane Center's (NHC) tropical cyclone forecasts utilizing hurricane tracking tools, (e.g., Hurrevac)
OPS	OSC	Consider potential threat to LUMA Transmission and Distribution Services (T&D).
CMC	Chair	Host an EOC pre-activation meeting to determine if the Emergency Response Plan (ERP) needs to be activated.
CM	CM	Prepare Tropical Weather Update in conjunction with the NWS Notifications for internal distribution until LEOC is activated.
CMC	Chair	Coordinate CMC conference call schedule, in coordination with local NWS Offices, NHC briefings and the PREMB.
CMC	Chair	Begin strategic planning for personal preparations.
CMC	Chair	Request activation status of FEMA IMAT and appropriate teams.
CM	CM	Request follow-up meeting with IT regarding tools and technology that are operating and available for use.
CMD	IC	Determine staffing needs based on the predicted event effects on the T&D System.
OPS	OSC	Determine the need to activate contingency contract manpower, or contracts that have been pre-negotiated in accordance with LUMA.
CM	CM	Conduct communications testing; equipment and alert/notification systems.
CM	CM	Identify and analyze the locations of critical communications assets in the anticipated impact areas.
PLAN	PSC	Determine current needs and anticipate future resource gaps – develop a strategy to resolve them.
CMD	PIO	Designate a PIO point of contact for media.
CMD	PIO	Develop and disseminate pre-incident preparedness messaging via LUMA social media platforms.
Pre-Storm - 96 hours - 4 Days Continue actions from the previous operational period as needed		
CMD	IC	LEOC Activation Level is recommended by the IC and/or CMC.
CMC	Chair	The LUMA CEO considers activating the LUMA Emergency Response Organization (ERO).
CMD	IC	LEOC IC determines the Event Staffing Matrix.
CMD	PIO	Coordinate with Planning regarding situational awareness and response preparedness messaging.
LOGS	LSC	Validate material stock levels against the damage predictive model and Event Classification Type.

LOGS	LSC	Coordinate with Finance and Purchasing regarding contracts.
LOGS	LSC	Notify Fleet and provide the CM Department's activation considerations for possible activation of the Fuel Plan.
CMC	Chair	LUMA CMC Chair determines if a Declaration of an Emergency is warranted. (In conjunction with PREMB)
CMC	Chair	Brief PREMB on the LEOC Division and Branch EOC Activation Status and Pre-Event Stage Reports.
CMC	Chair	Discuss the activation of the Emergency Response Plan (ERP).
CMD	IC	Confirm what elements of crisis and incident response organization need to be activated.
CMD	PIO	PIO follows emergency response communications protocols for internal and external staff and stakeholders.
OPS	ROC	Validate resources are available and operational within the ROCCs.
OPS	OSC	Conduct discussion regarding Mutual Aid requirements based on weather predictions.
LOGS	LSC	Conduct analysis of internal resources to identify status and availability based on geographical impacts to the area.
LOGS	LSC	Meet with Procurement regarding the approved list of contractors and local vendors regarding available resources.
LOGS	LSC	Establish contact with the Regional Logistics groups to ensure processes and protocols of restoration operations are identified and updated accordingly.
PLAN	RESL	Initiate activities for appropriate resource acquisition and internal mobilization.
LOGS	LSC	Coordinate with operations the possible need for barge Embarkation and Debarkation (Reception) ports.
LOGS	FACL	Activate LUMA pre-identified staging areas as needed based on the geographical area of predicted impacts.
OPS		Prepare staffing plan, schedules, and briefing for control centers as dictated for the Event Classification Type and LEOC Level of Activation.
OPS		Initiate activities for appropriate resource acquisition and internal mobilization.
LOGS		Identify possible Federal support requirements.
Pre-Storm - 72 hours - 3 Days Continue actions from the previous operational period as needed.		
OPS	ROC	Prepare staffing plan and schedules for respective Regional EOC as dictated for the duration level in the response matrix and approved by the Director.
PLAN	PSC	Coordinate and participate in conference calls with local NWS Offices, PREMB, PREPA, Government, and Municipalities.
OPS	OSC	Conduct Operations Team Briefing/Conference Call.
OPS	OSC	Develop staffing roster for continued operations periods and disseminate to staff.
FIN	FSC	Implement financial tracking and resource procurement procedures.
PLAN	PSC	Coordination and participation in all FEMA Region 2 Conference Calls.
CMD	IC	Coordinate with Command and General Staff to discuss geographic areas that may be affected.
CMD	IC	Evaluate the weather predictions and coordinate with LEOC General Staff to establish the LEOC Activation Level and Event Classification Type.
CMD	IC	In coordination with General Staff, discuss possible impacts on life safety, environment, operations, and infrastructure.
CMD	IC	Notify internal and external staff and partners, and stakeholders of the LEOC Activation Status via conference calls.
CMD	PIO	Based on predictions of weather impacts, recommend, and provide staff time to complete their pre-storm preparedness plan.
CMD	PIO	Verify the personal preparations plan has been engaged and ensure all personnel has been provided release time to complete.
CMD	LNO	Participate in pre-event planning and operational conference calls and meetings with internal, external and Stakeholders.

CMD	PIO	Develop Public Service Announcements (PSAs) for customers that provide NWS predicted onset of hazardous weather conditions information.
OPS	ROC	Notify SERTs and other personnel of the impending threat and the level of response required.
OPS		Evaluate Restoration Crews Staffing Matrix for pre-determined shifts.
OPS	OSC	Ensure the accuracy of the LEOC Staffing Rosters for the next operational periods.
OPS		Review the status of Generation operations with providers.
OPS		Evaluate the T&D System and OMS System operational status.
OPS		Ensure all T&D System redundant systems are in functional operating condition.
OPS	OSC	Coordinate the Operations Team Briefing Conference calls and meetings.
Pre-Storm - 48 hours - 2 Days Continue actions from the previous operational period as needed.		
CMC	IC	Coordinate with the LEOC Command to determine LEOC Activation Level and Event Classification Type.
PLAN	PSC	Establish a battle rhythm and provide it to LEOC Command Staff. Post in LEOC throughout Activation.
CMD	LNO	Coordinate approval of Pre-event notifications to key stakeholders, municipal officials, local government, and non-government organizations.
OPS	OSC	Develop and disseminate shift schedules for all SERT resources.
PLAN	RESL	Prepare Resource Request Forms (RRFs) and submit them to PREMB.
CMC	LNO	Discuss activation of ROCCs
CMC	IC	Communicate with the Agency Administrator and CMC on LEOC Activation direction.
CMC	Chair	Brief PREMB on the LEOC Activation Status.
CMC	Chair	Participate in LEOC Meetings to discuss potential impacts on geographic areas.
CMC	Chair	Coordinate with PREMB to identify Emergency Access requirements and potential issues regarding transportation expectations.
CMD	IC	Review and approve the LEOC and other activated ROCCs Staffing Roster.
PLAN	PSC	Coordinates LEOC Planning Cycle Meetings within each Operational Period. (Planning P)
CMD	IC	LEOC Incident Commander (IC) may activate the Division and Regional EOCs.
CMD	IC	Coordinate activities with the PREMB ESF-12 support function agencies (PREPA, P3, etc.)
CMD	PIO	Coordinate all communications regarding LEOC status, weather predictions, and operations IAPs are approved and disseminated by the PIO.
OPS	OSC	Coordinate with field operations that personal protective equipment has been provided to field crews.
OPS		Provide Briefings on LEOC and ROCCs situational awareness.
OPS	OSC	Identify in coordination with PREMB critical lifelines possible potential issues.
LOGS	LSC	Address possible shelter (housing/lodging) operations and logistical needs.
LOGS	RESL	Ensure resource allocation process and procedures are being followed.
LOGS	RESL	Consider demobilization planning with OPS based on current assets and projected needs.
LOGS	LSC	Identify types of resources needed for the anticipated event in coordination with OPS.
PLAN	SITL	Provide all internal staff and external entities, partners and stakeholders with Situational Report (SIT-REPs).
PLAN	SITL	Coordinate with GIS to provide potential areas to be affected.

FIN	FSC	Activate Emergency Response Policy and Protocols as necessary.
Pre-Storm – 24 hours – 1 Day Continue actions from the previous operational period as needed.		
CMD	PIO	Continue to focus on public information campaigns, specifically on reinforcements of protective actions.
CMD	IC	Finalize planning pre-landfall protective action requirements.
CMD	PIO	Ensure the PIO campaign is reaching target audiences and re-evaluate as necessary.
OPS	OSC	Evaluate the T&D System Status, the OMS and report findings and provide information to Plans for the Pre-Event Stage Reports.
OPS	PRG	Establish ancillary communications assets if traditional platforms are nonfunctional or unavailable (Live ICS Forms).
CMD	LNO	Coordinate with PREMB regarding critical lifelines status.
CMD	PIO	Coordinate communications regarding LEOC status, weather predictions, and operations IAPs are approved and disseminated by the PIO.
OPS	OSC	Coordinate suspension of daily operations for the next operating period including landfall.
LOGS	COML	Identify communication equipment primary and secondary functions post-landfall to field operations, EOCs, PREMB, internal and external entities.
LOGS	FACL	Coordinate with other Section Chiefs on any anticipated resource needs.
LOGS	TRUL	Coordinate with PREMB regarding emergency services transportation requirements.
PLAN	PSC	Coordinate ongoing Planning Cycle operations.
PLAN	REGS	Ensure all Sections are providing information for the IAPs.
FIN	FSC	Provide forms and documentation required to be completed for reimbursement purposes.
CMD	IC	Review and approve IAPs for prior operational periods.
Landfall - +0 to +48 Hours Continue actions from the previous operational period as needed.		
CMD	PIO	Coordinate all communications regarding LEOC status, weather predictions, and operations IAPs are approved and disseminated by the PIO.
CMD	LNO	Conduct ongoing communications with PREPA regarding Generation status updates.
CMD	IC	Coordinate all approved data and information with Unified Command, if established.
CMD		Update operations and discuss transitioning into a recovery based on operations, damage assessments and ETRs.
OPS	OSC	Deploy Damage Assessment Team, as needed.
OPS		Compare damage assessments and OMS reports; review with LOGS and CMD for response planning and reporting requirements.
LOGS		Coordinate feeding activities for response personnel and create schedules and locations.
OPS		Compile response data regarding staffing status, communications availability, and safety concerns during operational briefings.
CMD	SOFR	Re-iterate that all safety measures are being followed; resource management updates are to be provided to CMD.
LOGS	LSC	Validate the status of mutual aid resources.
LOGS		Report Staging Areas status reports to include resource accountability and availability.
LOGS		Coordinate with PREMB to identify transportation concerns.
PLAN		Collect, analyze, and distribute damage assessment reports in conjunction with LOGS and PLAN.

PLAN		Develop the Regulatory Reporting regarding Estimated Time of Restorations (ETRs).
FIN		Ensure reporting and tracking of all damage-related costs are being conducted.
FIN		Ensure costs tracking procedures are being adhered to.
CMD	IC	LEOC Activation Level is recommended by the IC and/or CMC.
CMD	IC	LEOC IC determines the Event Staffing Matrix based on the extent of impacts.
CMD	PIO	Coordinate with Planning regarding situational awareness and response preparedness messaging.
LOGS	LSC	Validate material stock levels against the damage predictive model and Event Classification Type.
LOGS	LSC	Coordinates with Finance and Purchasing regarding contracts.
LOGS	LSC	Notify Fleet and provide the CM Department's activation considerations for possible activation of the Fuel Plan.
CMC	Chair	LUMA CMC Chair determines if a Declaration of an Emergency is warranted. (In conjunction with PREMB)
CMC	Chair	Brief PREMB on the LEOC Division and Branch EOC Activation Status and Pre-Event Stage Reports.
CMC	Chair	Discuss the activation of the Emergency Response Plan (ERP).
CMD	IC	Confirm what elements of crisis and incident response organization need to be activated.
CMD	PIO	Follows emergency response communications protocols for internal and external staff and stakeholders.
CMD		Coordinate conference calls to discuss requirements for requesting waivers.
OPS	ROC	Validate resources are available and operational within the ROCCs.
OPS	OSC	Conduct discussion regarding Mutual Aid requirements based on weather predictions.
LOGS	LSC	Conduct analysis of internal resources to identify status and availability based on geographical impacts to the area.
LOGS	LSC	Meet with Procurement regarding the approved list of contractors and local vendors regarding available resources.
LOGS	LSC	Establish contact with the Regional Logistics groups to ensure processes and protocols of restoration operations are identified and updated accordingly.
PLAN	RESL	Initiate activities for appropriate resource acquisition and internal mobilization.
LOGS	LSC	Coordinate with operations the possible need for barge Embarkation and Debarkation (Reception) ports.
LOGS	FACL	Activate LUMA pre-identified staging areas as needed based on the geographical area of predicted impacts.
OPS		Prepare staffing plan, schedules, and briefing for control centers as dictated for the Event Classification Type and LEOC Level of Activation.
OPS		Initiate activities for appropriate resource acquisition and internal mobilization.
LOGS		Identify possible Federal support requirements.

Table 2 - H-120 timeline checklist



Emergency Response Plan

Annex E – Cybersecurity and Terrorism

LUMA ENERGY

CRISIS MANAGEMENT

May 27, 2022

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1 Purpose

The purpose of LUMA's Cybersecurity and Terrorism Annex (Annex E) is to establish an operational and tactical response to cyber and terrorist attacks. In addition to attacks, there is also a huge risk for these types of incidents to impact customers, facilities, and electrical lines. Today's modern utility systems rely heavily on high-speed communications and equipment, making the Transmission and Distribution System (T&D System) more susceptible to major destruction or control by acts of terrorism.

Incidents resulting from cybersecurity and terrorist attacks present an immediate risk to the availability of energy infrastructure and control systems, having a detrimental effect on the economy, environment, and safety of Puerto Rico citizens.

In recent years, such incidents have increased, raising situational awareness to enhance protective measures. Response considerations for terrorism and cybersecurity incidents must be considered, as the outcome can potentially be devastating to the entire transmission and distribution system, potentially affecting the whole island. Annex E helps define the operational, logistical, and administrative procedures that are carried out when responding to cybersecurity and terrorist attacks.

2 Scope

This Annex applies to an operational response triggered by cybersecurity or terrorism incidents that result in, or could result in, a major impact on the integrity of the T&D System or any other interruptions to electrical services to LUMA customers. The scope of this document is intended to serve as a guide for developing response actions and coordinating with all internal and external stakeholders and governmental agencies.

Execution of coordinated decisions, appropriate responses, and actions to activate resources contributes to a rapid and safe recovery and depends upon the scalability of this Annex.

3 Situations and Assumptions

3.1 Situation

As the threat landscape continues to evolve, it must be recognized that cybersecurity and terrorist attacks can happen anywhere and at any time and with operational and brand impacts on targets. The intent and capability of malicious attacks continue to increase while threat actors continue to use advanced tactics to the detriment of the safe and secure operation of critical infrastructure.

Puerto Rico contains critical infrastructure that is a potential target to threat actors with motivation to engage on cybersecurity or terrorist attacks. It is important to understand potential motivation factors (motivators) as these may indicate the scope and magnitude of the impact of an attack. Attack motivators include:

- Financial Gain
- Recognition & Achievement
- Insider Threat
- Political Motivation
- State Actors

The motivators above may lead threat actors to consider the electrical system or supporting technologies as viable targets. Throughout Puerto Rico, there are many critical infrastructure vulnerabilities that remain a potential target for cybersecurity

or terrorist attack. This infrastructure contains assets, networks, and systems vital to sustaining life and the environment on the island. The success of this Annex is predicated on LUMA's commitment to respond, as such incidents can interrupt the economic environment, public health, and security for all.

Execution of the appropriate responses to affect rapid and safe recovery is dependent upon the successful execution and scalability of the response plans in this Annex. The number of customers affected and the magnitude of an emergency outage event varies, but the operational concept stays consistent. The level of recovery resources can be adjusted as needed.

3.2 Assumptions and Considerations

The Emergency Response Plan (ERP) – Base Plan and the Major Outage Restoration Annex (Annex A), describes the general assumptions and considerations. Identified below are additional assumptions and considerations regarding response to a cybersecurity or terrorist attack which include, but are not limited to the following:

- Cybersecurity and terrorism incidents can substantially disrupt not only security measures and the community's resilience but also electrical infrastructure and facilities.
- Terrorist attacks may or may not be preceded by a warning or a threat and may at first appear to be an ordinary power outage or system failure incident.
- Information on such incidents should be accurate, relevant, timely, and actionable.
- Threat or incident information should be shared with critical infrastructure customers.
- These incidents create challenges that are usually beyond normal day-to-day operational protocols, as well as tactical and operational requirements.
- Acts of terrorism and cybersecurity attacks may adversely impact the availability of local public safety personnel, equipment, facilities, and communications systems.
- Mutual Aid Agreements or Memorandum of Agreements are maintained and activated when the scope of the incident requires additional resources beyond LUMA's capabilities.
- LUMA utilizes the National Incident Management System (NIMS)/ Incident Command System (ICS).
- Cybersecurity and terrorism incidents or events may require federal assistance.

Attack Motivator	Complexity and Required Capability	Operational Impact	Probability
Financial Gain	Low – Moderate	Low	High
Recognition & Achievement	Medium	Low – Moderate	Low
Political Motivation	High	Low – Moderate	Moderate
Corporate Espionage	High	Moderate	Low – Moderate
Insider Threat	Low – Moderate	Moderate - High	Moderate
State Actors	High	High	Low – Moderate

Table 1: Potential Motivators ranked by complexity of attack, potential operational impact and probability of occurrence from a utility perspective

4 Concept of Operations

In the event of a cybersecurity or terrorist attack that results in or may result in power outages or damage to facilities, LUMA promptly assesses the impacts on the T&D infrastructure and take the necessary steps to mitigate the cascading effects of the ongoing power outages and implement restoration protocols. To ensure response integration, the Puerto Rico Emergency Management Bureau's (PREMB) Incident Levels and LUMA's Event Classification Types are utilized and identified in the LUMA ERP - Base Plan.

LUMA has also implemented a Cybersecurity Incident Response Plan which is set into motion to detect, triage, respond, contain, recover, and post-mortem for a possible or suspected cyber-event. This process is followed and—in conjunction with the ERP—described below to mitigate and respond to adverse impacts to business operations.

There are five (5) Event Classification Types LUMA Emergency Operations Center (LEOC) Activation Levels. Please reference Attachments 2 and 3 for these charts. During a cybersecurity or terrorist attack that is most likely be a no-notice event, an Event Classification Type is chosen before a LEOC Activation Level.

4.1 LEOC Activation

The Incident Commander (IC) is responsible for analyzing the severity, complexity, and size of the incident with the collaboration and input of the Command Staff to determine if a cybersecurity or Terrorism event requires the activation of the LEOC. LUMA may activate the Crisis Management Committee (CMC), Command Staff, and General Staff to support the response.

4.1.1 No-Notice Incidents

A no-notice incident occurs unexpectedly or with minimal warning. No-notice incidents do not provide emergency responders enough time to prepare for the specific event. A cybersecurity or terrorist attack is generally an example of a no-notice incident. During a no-notice event, the determination of an Event Classification Type is typically needed before the establishment of a LEOC Activation Level. This is done by the IC once designated by the CMC.

4.2 LUMA Event Classification Types

The IC may deem it necessary to escalate or de-escalate an Event Classification Type and/or LEOC Activation Level. This is dependent on changes in circumstances or actual conditions differing from projected conditions. The Event Classification Types are as follows:

- Event Types 4 and 5 are Non-Emergency Events.
- Event Types 1, 2, and 3 are Emergency Events.
- Event Type 1 represents catastrophic emergency conditions.

The LUMA Event Classification Types and their anticipated operating conditions are described in Section 6 of the Base ERP and Section 7 of Annex A.

4.3 Restoration Operations

Restoration Operations conducted in response to an event impacting LUMA's distribution and transmission scheme are the responsibility of the Planning and Dispatch Team. Directives from the LEOC follow the LUMA Restoration Strategy and the Concept of Operations, both of which can be found in full in the Major Outage Restoration Annex (Annex A, Section 6s and 7).

4.3.1 Approach

Cybersecurity and terrorist attacks are geared toward breaking laws or being unlawful. Therefore, the response includes local and federal Law Enforcement. Following the dispatch notification regarding the cybersecurity or terrorist incident, an emergency shall be declared by the LUMA Energy Chief Executive Officer (CEO) or his/her designee.

4.3.2 Mobilization of Personnel

If it is not possible to effectively manage the attack or incident through normal operating procedures, the LUMA Energy Emergency Response Organization is activated by the CMC at the direction of the LUMA CEO.

The IC, or his/her designee, shall subsequently establish an Event Classification Type relative to the type and complexity of the event, resources that may be needed, and the expected impacts of the event. The LUMA Event Staffing Matrix (Appendix A in the ERP – Base Plan) is used to aid the IC in determining the staff required for emergency operations based on the Event Classification Type. The IC then determines the required Command and General Staff needed to activate the LEOC.

LUMA may be required to institute a rapid deployment of local and federal resources in the safest manner possible depending on the event classification. The most critical component to mobilizing personnel is flexibility to adapt to optimum levels as the incident changes. Notifications are made in accordance with the LUMA Performance Metrics for the Mobilization of Personnel located within Annex A.

The IC:

- Follows the Incident Command System (ICS) to maintain span of control and assign roles and responsibilities to LEOC Command and General Staff
- Establishes initial protective actions for emergency responders
- Sets-up an Incident Command Post in a safe area
- Notifies community agencies, stakeholders, and customers of the incident
- Supports the Operations Section Chief (OSC) in acquiring needed resources

The OSC:

- Obtains a preliminary assessment of the number of customers affected and assist in development of restoration plans
- Ensures the Planning and Intelligence and Logistic Sections are aware of the operations resource requirements and are requesting and obtaining the necessary additional resources
- Monitors the overall effectiveness of the field restoration activities to accomplish the stated Incident Action Plan (IAP) objectives.

LEOC Staff:

- Supports the IC, as required or assigned by the IC
- Coordinates with community or federal agencies for assistance as necessary
- Manages response activities and effective teamwork to reduce restoration times

Law enforcement:

- Supports the IC, as required
- Coordinates with community or federal agencies for assistance as necessary
- Assigns and manages response activities

The transition from response operations to restoration operations is considered when the following are addressed:

- Mobilizing/demobilizing our organization and resources as directed by Law Enforcement.
- Overseeing the deployment and direction of our staff in the performance of the specific tasks associated with their respective function.
- Making available a well-trained workforce to staff our respective functions.
- Adhering to all applicable environment, health and safety rules, regulations, and procedures.

After an interruption and activation of the ERP, the restoration of electrical services is carried out by following four basic steps:

- Responding with appropriate resources to address emergency and life-threatening conditions regarding.
- Damage Assessment (Rapid and Detailed Assessment)
- Prioritization of Restoration
- Disseminate timely and accurate communications of system conditions

4.3.3 Damage Assessment

A Damage Assessment (DA) is a key component of restoration operations. Generally, assessment personnel is managed through the System Emergency Restoration Teams (SERTs) and provide their report to the Regional Commander. The order of evaluation is based on the Restoration Priority Matrix Guidelines identified within Annex A, Section 7.3.

- The T&D System Control Center monitors and develops an initial system status report. This report is used to compare the current level of electric demand on the system to the forecasted demand.
- The DA report is disseminated to the Operations Section in the LEOC where resources and equipment requirements are identified.
- Regional SERT teams execute restoration operations identified by the LEOC and Regional Commanders.

4.3.4 Restoration

In accordance with Law Enforcement safety protocols for cybersecurity and terrorist attacks, LUMA teams and restoration crews are dispatched and respond with priorities identified within the ERP.

Prioritization

Outages are prioritized by:

- Considerations of safety conditions.
- Number of damages to LUMA facilities and/or infrastructure.
- Critical Community Lifelines, customer type, and the number of affected customers.
 - LUMA identifies a summary of Major Outage Event Performance Metrics located within the ERP, Annex A.

Situational Assessment

LUMA completes an evaluation of the system through the Supervisory Control and Data Acquisition System (SCADA), Outage Management System (OMS), and reported outages from LUMA customers. During an emergency outage incident or event, the LUMA Public Information Officer (PIO) provides situational awareness messaging to internal and external stakeholders.

4.3.5 Make Safe Protocols

During a minor or major event, the number of resources that are trained and readily available may be limited, and the demand could greatly exceed those available. LUMA ensures “make safe” actions are taken and acknowledges it may be necessary to contract for additional resources to support “make safe” and restoration activities.

5 Estimated Time of Restoration

A cybersecurity or terrorism incident that causes the T&D System to fail must be addressed as soon as possible. This type of emergency outage event may impede restoration operations depending on the criticality of system infrastructure, system sensitivity, and public health. Municipal emergency response resources assist LUMA in gaining detailed information regarding the status of affected T&D systems to provide status updates and reports to partners, as well as the community throughout the incident.

The flexibility of an event requires a strategic, deliberate, planning-oriented posture which allows a utility to plan resource needs, operational periods, strategic objectives, staff fatigue, and external communications. The expected actions related to Estimated Times of Restoration are found in Annex A of the ERP, Section 8.

6 Organization

This section describes the key functions of the various components and positions of the organizational structure. An orderly and consistent flow of information between operations, communications, logistics, and partner support organizations is necessary in times of emergency outage events.

LUMA has seven Emergency Operations Centers; the LEOC and six LUMA Regional Operations Command Centers. The organizational charts indicating the lines of authority and the interrelationship between the organizational groups can be found in Appendix A of the Annex A.

6.1 LUMA Leadership

LUMA leadership maintains an ongoing and open dialogue to discuss and share information about the impact a cybersecurity or terrorism emergency outage event has on the T&D System. This dialogue ensures full situational awareness among leadership teams and provides a platform to facilitate discussions on the possible exchange of staff resources and other support functions between entities.

This approach provides the mechanism for consistent messages to employees, customers, and other external stakeholders. Following a cybersecurity or terrorism incident, the LUMA leadership team and the CMC activate the applicable functional areas as needed.

6.2 Emergency Response Organization

The organizational structure of LUMA during outage restoration can be found in Appendix A of Annex A. Refer to the LUMA ERP – Base Plan for a list of roles and responsibilities.

7 Direction, Control, and Coordination

This Annex provides the framework for the systematic response when cybersecurity or terrorism incidents arise, and emergency restoration operations are required. Determination of an appropriate response is based on multiple factors which include coordinated response utilizing the ICS and working together with stakeholders and various community or federal agencies

A cybersecurity or terrorist incident may require assistance from off-island and federal agencies. Utilizing mutual aid agreements to receive these resources allows the operation and demobilization process to run smoothly. Tracking the release of resources that are no longer required to support the response is essential for accountability and managing incident control. This assists in reducing the loss of resources, limiting operating costs, and ensuring retention and availability of resources for other activities and assignments as needed.

The ERP and its Annexes and Appendices identify the framework to respond to and recover from natural or man-made events. For additional information related to direction, control, and coordination, refer to the ERP – Base Plan, Section 8.

8 Communication

LUMA provides timely, accurate, and consistent communications following a cybersecurity or terrorist attack. Emergency communications may include alerts and warnings from verified emergency notifications. Communications may include information about protective measures, LUMA response and restoration status, available assistance, and other matters affecting LUMA's response and recovery.

The LUMA PIO communicates timely and accurate information. LUMA communicates information through a variety of methods, including but not limited to the following:

- LUMA website and customer outage map
- News media
- Social messaging including the use of Twitter, Facebook, and WhatsApp, among others

LUMA has established a consistent messaging platform that is flexible enough to allow for internal or external expansion, depending on the LEOC Activation Level and Event Classification Type.

9 Demobilization

This Annex provides the framework for the systematic response to emergencies due to cybersecurity or terrorist attacks when emergency restoration operations are required. Determination of an appropriate response is based on multiple factors, which include:

- Approach to determining response efforts between roles and responsibilities
- Response efforts in accordance with the type of event
- Coordinated response utilizing the NIMS and the ICS

The IC has the responsibility to initiate the De-escalation/Demobilization process. Demobilization is the orderly, safe, and efficient return of operations, facilities, and resources to their pre-event status. Demobilization planning is an on-going process that facilitates accountability and ensures efficient resource management.

Tracking resource requirements and releasing those resources that are no longer required to support the response is essential for accountability and managing incident control. This assists in reducing the loss of resources, operating costs, and ensuring retention and availability of resources for other activities and assignments as needed.

The Planning and Intelligence Section Chief develops demobilization plans and ensures they are implemented as instructed by the IC.

The emergency response operations may be fully demobilized when:

- All event-related jobs are assigned
- Centralized Dispatch is managing the event
- All non-regional crews are released

10 Training and Exercises

The successful response to emergency events requires a Company-wide commitment to preparedness integrated into LUMA's daily operations, not just during emergency events. Emergency preparedness activities can include planning, training, and participating in exercises; attending meetings with public safety officials, Crisis Management Department staff, and PREMB personnel; and maintaining updated contact information of personnel and organizations that may assist in LUMA's restoration efforts. Every employee is expected to participate in preparedness activities throughout the year.

The Crisis Management Department maintains the ERP-related training database and coordinates ERP role-related training. Training, drills, and exercises are designed and conducted to develop and improve the knowledge and skills of personnel assigned to emergency response activities, and support the safe and reasonably prompt completion of all required actions during ERP activations.

The LUMA exercise program is consistent with the Homeland Security Exercise Evaluation Program (HSEEP) developed by the Federal Emergency Management Agency (FEMA). The HSEEP methodology is defined and implemented using seven exercise types, broken into the categories of discussion-based exercises and operations-based exercises. LUMA employs a variety of these exercise types based on the exercise goals and objectives. The goal of conducting exercises is to enhance training, improve familiarization, evaluate and/or validate plans, policies, and procedures, increase capabilities, and practice skills in a no-fault, risk-free environment.

11 Annex Development and Maintenance

This Annex is a living document. Development and maintenance of this Annex are in conjunction with the LUMA ERP – Base Plan. Proposed changes should be sent to the Crisis Management Department for approval and inclusion.

Please reference the ERP – Base Plan, Section 13, Plan Development and Maintenance, for additional information.

12 Explanation of Terms

12.1 Acronyms

CEO	Chief Executive Officer
CMC	Crisis Management Committee
DA	Damage Assessment
EOC	Emergency Operations Center
ERO	Emergency Response Organization
ERP	Emergency Response Plan
ETR	Estimated Time of Restoration
FEMA	Federal Emergency Management Agency
HSEEP	Homeland Security Exercise Evaluation Program
IAP	Incident Action Plan
IC	Incident Commander
ICS	Incident Command System
IT	Information Technology
JIC	Joint Information Center
LEOC	LUMA Emergency Operations Center
MAA	Mutual Aid Agreement
MOA	Memorandum of Agreements
NIMS	National Incident Management System
OCM	Office of Crisis Management
OMS	Outage Management System
OSC	Operations Section Chief
P&I	Planning and Intelligence (Section)
PIO	Public Information Officer
PREMB	Puerto Rico Emergency Management Bureau
PSC	Planning & Intelligence Section Chief
REOC	Regional Emergency Operations Center
ROCC	Regional Operations Command Centers
SCADA	Supervisory Control and Data Acquisition
SERT	System Emergency Restoration Team
T&D	Transmission & Distribution

12.2 Terms

Assumptions – Operationally relevant parameters expected and used as a context, basis, or requirement for the development of response and recovery plans, processes, and procedures.

Cybersecurity – The practice of protecting critical systems, networks, programs, and sensitive information from digital attacks.

Damage Assessment – A mechanism utilized to determine the magnitude of damage and impact of disasters.

Disaster – An occurrence of a natural catastrophe, technological accident, or human-caused event that has resulted in severe property damage, deaths, and/or multiple injuries and exceeds the response capability of the local jurisdiction and requires the Government of Puerto Rico, and potentially Federal, involvement.

Emergency or Emergency Event – Any outage event, as per the T&D OMA; declared emergency or major disaster; or event, whether natural or manmade, that requires responsive action to protect life, property, and/or operational capacity where LUMA has deemed it an Emergency and/or necessary to activate the LUMA Emergency Operations Center.

Impede – to delay or hinder something or a process

Incident Action Plan – Includes the overall incident objectives and strategies established by the Incident Commander. The Planning Section is responsible for developing and documenting the IAP.

Incident Commander – The individual appointed by the Company's executive management to have overall responsibility for LUMA's response during an Emergency Event.

Incident Command System – Coordinated and collaborative incident management construct specifically designed and made a part of the National Incident Management System (NIMS) under the Federal Emergency Management Agency (FEMA).

Joint Information Center – A central point of contact for new media and interest parties to coordinate incident information activities.

Terrorism – The unlawful use of threat violence, especially against the public or government as a politically motivated means of attack, coercion, and intimidation.